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MIGRAINE constitutes one of the most disabling of common maladies; but despite a vast amount of interest in the subject, we are still uncertain about its pathology, its nature, and its cure. Yet migraine has been the happy hunting-ground of the theorist, and the problem has been attacked by representatives of all branches of medicine. Each in turn has discovered in migraine phenomena pertaining to his own specialty; each in turn has hit upon the true nature of the malady; in turn, each has found the infallible remedy. Obviously, such mutually exclusive viewpoints cannot all be entirely correct, and the multiplicity and diversity of the hypotheses suggest that the problem is more complex than imagined, and probably one which presents a number of facets.

That the problem is many-sided is suggested by the wealth of the clinical aspect. In fact, one of the usual errors in describing and explaining migraine is to ignore the less typical though common forms which the malady may offer. It will be necessary at the outset to contrast the usual text-book account of the migrainous phenomena with the manifestations as they actually occur.

### What is Migraine?

According to the common description, migraine is a paroxysmal affection comprising severe unilateral headache, preceded by visual phenomena and followed by nausea and vomiting. Undoubtedly, this account is sufficiently accurate to enable a large number of cases to be recognised, but it gives no hint of the occurrence of a far greater number of slighter and incomplete forms, nor of the rarer severe and even catastrophic manifestations. Detailed study of migrainous subjects reveals clearly that attacks may differ in degree and complexity in the same person; and with advancing years, as everyone knows, the attacks may alter and eventually cease to correspond with the classical description of the disease. Nevertheless, these slighter attacks must surely be merely variants of "ordinary" migraine.

Acting upon such clinical data, we may state that *any one of the classical symptoms* (teichopsia, headache, and vomiting) *may be absent.*

Migraine without visual phenomena is, of course, well known, but it is doubtful whether the frequency of such is appreciated. Out of Elliot's series of 300 cases, 18 per cent. complained of hemianopia and 25 per cent. of zigzags or fortification signs. Other alarming visual troubles were noted in 44 per cent., but some of these overlapped the figure for the two previous items. Our figures suggest that visual phenomena are even rarer, and it is possible that the percentages in Elliot's cases are higher because of the nature of the author's practice and experience. It must also be remembered that a large number of patients wake with a migrainous headache, and the visual excitation might have occurred during the sleeping hours.

Certainly nausea and vomiting are often absent, even though headache and visual symptoms are marked. In Elliot's series no nausea and vomiting occurred in one-quarter of the cases. Again, we would suggest that this proportion is too low.

Lastly, in a few instances, headache itself may be in abeyance. This is admittedly rare, and might legitimately cause diagnostic argument, were we not mindful of the occasional absence of headache in the elderly migrainous subject. Under treatment, moreover, the headache may be cured but not the other phenomena.

Advancing our argument further, we may even state that *any two of the classical symptoms may be absent,* and yet the diagnosis of migraine remains. Thus visual phenomena and vomiting may both be absent, the migraine attack being represented by headache alone. Cases of this type are, indeed, common. It may be asked how in such circumstances the diagnosis is made. The character of the headache itself is not without significance, and some of the accompanying disorders, such as confusion, irritability, anorexia, giddiness, photophobia, inability to "carry on," are features which distinguish it from other types of headache. A headache which leads to drowsiness and sleep is suggestive of migraine. The occasional occurrence of other phenomena—teichopsia or vomiting—during one of the patient's usual headaches also indicates the migrainous nature. One may summarise by stating that migraine is the commonest cause of severe periodic headaches, accompanied by prostration—especially if present in the early morning on waking.

If we grant that headache alone may represent a not uncommon type of migraine, we must also admit that vomiting alone and visual phenomena alone are both rare types of migraine. Again, diagnosis may be disputed here, but the periodic occurrence of visual symptoms alone in a migrainous subject is highly suggestive of an abortive attack. Bouts of vomiting alone may occur in younger subjects prior to the development of the complete forms of migraine, and also in the migrainous subject during pregnancy. For these and other reasons we affirm that attacks of vomiting alone may constitute a *forme fruste* of a migraine attack.

### Characteristics of the Attack

It will be unnecessary to recapitulate the well-known features of the attack of migraine and to describe the various types of visual disorder which may be experienced. More useful perhaps would be a bare statement of some of the clinical points which are so striking as to demand an explanation in any hypothesis which may be advanced concerning migraine; and, furthermore, a correction of certain incorrect or exaggerated statements commonly made.

(1) *The headache is often not unilateral.* Although this statement challenges the very name of the malady, nevertheless careful introspection reveals that in a high proportion (perhaps even 50 per cent.) the pain does not strictly concern one-half the head.

* The opening paper at a discussion at the Harveian Society on Dec. 8th, 1932.

The pain may be more intense on one side, without, however, any strict unilaterality. Pain may be noted in the frontal, parietal, or occipital regions; it may affect the summit of the skull; may occur in the temples or may be referred to one or both orbits. The location of the pain often varies from one attack to another in the same subject.

(2) *Attacks of migraine usually commence in youth and alter or diminish in intensity with advancing years, and may even cease altogether.* The general truth of this statement must not deceive one as to the rarer instances of true migraine appearing in childhood, and even commencing in middle life or old age. One hears at times that migraine ceases with the climacteric; this statement is not altogether correct. Actually the migrainous patient suffers an exacerbation at the menopause, and may continue to suffer alarming attacks for some time afterwards.

(3) The duration of the average attack of migraine, from the commencement of the visual symptoms to the disappearance of the headache, is a matter of some hours. One must remember that *unusually short and unusually long attacks may occur.* Thus we have known patients whose attacks from start to finish do not exceed 15 minutes. On the other hand, severe attacks of migraine may persist for a week, at the end of which the patient may be debilitated, exhausted, and irritable for another six or seven days.

(4) *Vomiting does not necessarily relieve the headache.* Despite statements to the contrary, we can definitely affirm that it is rather exceptional for an attack of migraine to be concluded, or the headache relieved, by the act of vomiting.

(5) *Migraine usually ceases during pregnancy.* This important statement holds true for the great majority of cases. The course of the pregnancy, however, is usually complicated by excessive vomiting.

## Clinical Types of Migraine

When one reviews the symptomatology of a large series of cases of migraine, one is struck with certain broad similarities as well as with certain individual differences. The former constitute the general points of contact which make up our conceptions of migraine as a clinical entity. The individual features, however, are both interesting and important. When collected and sifted, they can be arranged into groups, each containing certain combinations of peculiar features. In this way we can isolate certain clinical subgroups, the ætiological and therapeutic significance of which are suggestive.

(1) *The bilious type.*—A type will emerge in which persistent vomiting dominates the picture. Ocular disturbance is slight or absent; headache is present but not severe. The vomiting is obstinate and may last three or four days; food is refused; collapse, loss of weight, and acidosis are often present towards the end of the attack. At times a slight icteroid tinge may be noticeable in the conjunctivæ; the patient may complain of abdominal discomfort or of pain. A slight rise of temperature at times has been noted.

(2) *Ocular type.*—Here the main symptoms are visual in nature. The attack commences with a series of visual experiences of a positive nature (fortification figures, zigzags), or of a negative character (scotomata, hemianopia). These may be accompanied or followed by an illusory distortion of vision, such as the apparent movement or obliquity of objects; diplopia; megalopsia or micropsia; optical allo-æsthesia. A state of ocular vertigo follows, often accompanied by pain in the head or in the eyeball. Vomiting usually does not occur. The visual symptoms persist throughout the attack, dominating the picture. Examination usually reveals some slight and uncorrected refractive errors, often heteronymous in type; full correction of these errors often leads to marked relief.

(3) *Menstrual migraine.*—A very common subgroup is occupied by those cases of migraine in females, starting at the time of the first period, and regularly recurring with each succeeding menstruation. The migraine may accompany or closely precede or follow the period. Should the patient miss a period no migraine occurs. During pregnancy the migraine usually ceases, though vomiting may be excessive. At the menopause the migrainous symptoms are aggravated, but they cease with the complete cessation of the climacteric. Whether any structural peculiarities exist in these cases—as, for example, in the region of the sella turcica—is debatable. That special endocrine therapy is indicated in this type of case seems clear from practical as well as theoretical data.

(4) *The "cerebral type."*—A type of migraine in which intense headache, without visual or bilious accompaniments, is the all-important symptom, may perhaps be isolated. Sometimes a focal intracranial lesion is suspected because of the severity of the pain; the dramatic type of onset in some cases; the frequent localisation of the pain to one particular region of the cranium; the severe giddiness, restlessness, irritability, and photophobia suggestive of meningeal irritation. Attacks of this kind may be precipitated by sudden physical exertion, such as running up a station incline carrying a suitcase. Sometimes exposure of the bare head to sunlight ("heat-stroke") may be responsible. The sufferer often has some degree of hyperpiesis with or without arterial change.

An association with cerebral arterial disease is at once suggested, and one naturally asks whether such attacks might not constitute the pre-rupture symptoms of cerebral aneurysm. It is well known that the previous medical history of patients known to suffer from an aneurysm on the circle of Willis may be characterised by periodic "migrainous attacks." The following case is instructive:—

A man of 37 had been subject for 12 years to terrible bitemporal "migrainous" headaches, lasting hours or days. They would occur two or three times a year, and were always precipitated by business or domestic worries. He would disappear into a quiet room and try to sleep off the attack. There would be no vomiting and no visual disorder. In July, 1930, during a typical headache, he collapsed, lost consciousness, and was convulsed down the right side. On regaining consciousness a right hemiparesis with aphasia was found. Lumbar puncture revealed an evenly blood-stained cerebro-spinal fluid. Paretic signs persisted for some weeks.

About five months later the patient reported, according to instructions, at the casualty department, as he was suffering from another of his migraine attacks. Dr. A. Gilpin immediately performed another lumbar puncture and found a cerebro-spinal fluid which contained about 60 red blood-cells per c.mm.

Is it possible to isolate clinically a type of migraine associated with cerebral aneurysm? The inconspicuousness of teichopsia and vomiting is an important point, although visual phenomena have been described in the pre-rupture headaches. Adie believes that the consistency with which a unilateral headache appears on the same side is of importance; in other words, a headache which is left-sided in one attack and right-sided in another argues against the

presence of aneurysm. Support is afforded by the demonstration of other somatic disorders of development, such as congenital heart disease, coarctation of the aorta, and skeletal anomalies. Albuminuria may also be of possible significance.

(5) *Allergic migraine.*—Everyone is familiar with the conception of migraine as an allergic disorder, occurring in families in which other allied affections occur. Without question, there are patients in whom migraine occurs in alternation with attacks of asthma, of angioneurotic œdema, or of urticaria. Undoubtedly, also, migraine may develop during adolescence after a childhood of cyclical vomiting. For these and other reasons it appears clear that a type of migraine exists which bears a close association with disorders of an allergic character. At the same time it must be emphasised that such cases are in the minority, and probably are too few in number to permit far-reaching conclusions as to ætiology or pathogenesis. We feel that the case for the allergic nature of migraine has been overstated.

## MIGRAINE MAJOR

The analogy between migraine and epilepsy has often been made; the many points of contact between the two disorders serve as useful guides in clinical description as well as suggestive features in ætiology. Just as we arbitrarily describe a major and a minor form of epilepsy, so we may isolate a variety of migraine which from its severity and at times almost dramatic characters may be spoken of as "migraine major."

In this category belong the particularly severe examples of the bilious and of the cerebral types, where the intensity and protraction of the symptoms may arouse doubt as to the original diagnosis. Differentiation will have to be made in such cases from acute abdominal emergencies and from gross intracranial disease. The accompanying prostration and loss of weight take these examples of migraine out of the category of a minor malady.

We must mention here those cases where neurological symptoms are present in striking degree. Thus mental confusion, the paraphasic speech defects, the feelings of numbness in the face or extremities, may be so marked as to suggest cerebral tumour or thrombosis. Although these features are not rare even in minor forms, they may occasion difficulty in diagnosis when severe or protracted.

To the group of migraine major also belong certain complicating events of a severe and even alarming nature.

*Status hemicranicus.*—Occasionally a patient may emerge from a severe bout of migraine only to commence immediately another turn. In this way one attack may succeed another for as long as a month. Upon the analogy of the epileptic phenomenon the term "status hemicranicus" is applied. During this state the patient is never entirely free from headache, though it may fluctuate. Extreme physical and mental prostration may result; the patient may lose a stone or two in weight, and prolonged convalescence may be required. If subjective sensory disturbances occur during each attack, then objective sensory impairment of a hemiplegic distribution may be demonstrable.

This distressing state offers to the researcher an opportunity for clinical and biochemical investigation of the migraine phenomena. The results have been rather meagre, however. From the few facts which have emerged we know that the stomach is dilated, atonic, and immobile. Furthermore, we know—and this will surprise those who envisage in migraine the effects of intracranial hypertension—that the cerebrospinal fluid pressure is reduced, the composition of the fluid being normal. In this way the migraine symptomatology bears a resemblance to the post-lumbar puncture headache.

*Migraine-epilepsy* must be placed among the major manifestations of the disease. Not only can we trace an analogy between the phenomena in epilepsy and in migraine, but a closer association may at times be traced. Epilepsy may occur among the relatives of a migrainous subject; or epileptic and migrainous attacks may alternate in the same person; or epilepsy may cease and be replaced by attacks of migraine, the fits reappearing in later life when the migraine has abated. The term "migraine-epilepsy" is best restricted, however, to those cases where unconsciousness—with or without convulsions—occurs at the height of the migraine attack. In this way the visual phenomena and the headache act like a slow and prolonged aura. It is noticeable that when a migrainous attack culminates in unconsciousness, the headache is thereby entirely relieved and the attack cut short. Without the unconsciousness the attack would have dragged on for many hours or days, with vomiting and prostration.

The association between epilepsy and migraine is not a simple one. While it is true that epileptic manifestations at times appear in the personal or family history of a migrainous subject, the converse rarely applies. Thus it is distinctly unusual for genuine migraine to occur in subjects who are chronic or confirmed epileptics.

*Migrainous neuralgia.*—Sometimes the attack of migraine is accompanied and followed for some days by severe neuralgic pain in a limited area of the face or head. The patient may complain of severe pain localised to the eyeballs, the inner canthus, the side of the nose, temple, malar ridge, or mastoid region. Even the neck and shoulders may be affected. The pain may commence in the attack but persist for days or weeks after its finish. No objective sensory disorder can be demonstrated other than local tenderness.

In certain of these cases careful investigation reveals a condition of non-articular rheumatism, as betrayed by a tender nodule or thickening in the muscles or aponeurosis of the head and face. Tenderness along the course of an occipital or supra-orbital nerve may at times be present.

*Persistent paralytic manifestations.*—These constitute an interesting though uncommon series of phenomena. During the attack of migraine certain neurological signs may appear, and though becoming less noticeable when the attack has ended may not entirely disappear. With succeeding turns they reappear and eventually become permanently installed.

Pupillary inequality may be quoted as an example. The patient's friends may notice that during an attack one pupil becomes much smaller than the other. The difference becomes less noticeable between the attacks. In the course of time the anisocoria becomes permanent, and the patient may present a small inactive pupil on one side, with a normal mid-dilated pupil on the other.

Persistent hemianopia is another well-known sequel of chronic migraine. This defect may appear insiduously as a permanent feature, but more often it is ushered in abruptly at the height of an attack by an epileptiform seizure.

Most characteristic is the well-known ophthalmoplegic migraine, where a recurrent ocular paresis eventually becomes permanent. The third nerve is the one implicated in by far the greatest number of cases, but very exceptionally the fourth or the sixth nerves may be concerned.

Persistent hemiplegia, which may be accompanied by aphasia, has not infrequently been seen after chronic migraine. One patient in our series had suffered for many years from severe recurrent migraine, and later, in middle life, developed with some suddenness paretic manifestations down one side of the body. Similar cases might be quoted from the literature. The well-known Dr. Parry, of Bath, was a lifelong victim of migraine, and indeed wrote one of the classical accounts of this affection. In 1822 he died from the effects of a focal cerebral lesion with hemiplegia, aphasia, and agraphia. The evidence of the pathological data has shown that in these cases the lesions have been thrombotic in type. The coexistence of two such common disorders as migraine and cerebro-vascular disease would not attract attention were it not for the frequent story that the migraine in such cases has been associated with transitory symptoms of speech disturbance, numbness, and weakness affecting one side of the body—symptoms which have been made permanent by the cerebral thrombosis. In such cases one cannot but wonder whether the repeated migrainous attacks may not have so affected the structure of the cerebral blood-vessels as to have facilitated a terminal vascular accident.

### MIGRAINE EQUIVALENTS

Pursuing the analogy with epilepsy a little further, we may apply the term "migraine equivalents" to those episodic events which occasionally seem to replace a true attack of migraine. Their nature is varied: they may comprise a period of mental confusion and a sense of unreality lasting for a few hours; a spell of giddiness or of nausea; paroxysmal tachycardia; tinnitus. The transient psychoses are the common equivalents, and naturally alternative diagnoses may be raised. According to J. M. Nielsen, it is necessary for the psychic disturbance to be of short duration (hours to possibly two days); to be unassociated with loss of consciousness; to be non-progressive in character; and not to lead to deterioration. It is highly important that true migraine must also be present, and there must be no evidence of hysterical or of epileptic tendencies. Lastly, the psychical state must be normal between the attacks.

The classic work of E. Liveing contains numerous examples of migraine metamorphoses, as he named these equivalents—including attacks of gastralgia, of angina pectoris, of gout, and of nocturnal laryngeal spasms.

## The Migrainous Constitution

Investigation of a case of migraine comprises largely a minute study of the patient's symptoms, the factors of possible predisposing or precipitating significance, the personality of the victim in the widest physical and psychological sense, the record of previous illness, and, finally, the family history.

Physical examination is important, but occupies a secondary place. As in epilepsy, neurological "signs" are usually absent. Errors of refraction and of ocular balance must obviously be sought and corrected. Fundus abnormalities are not typically present; cardiovascular disorders are usually absent. Detailed information as to the physical habitus is lacking on an adequate scale, and herein lies a field for research which might prove of value.

Among the details of personal and family history which seem of importance we might stress the frequent occurrence of migraine, more especially in a parent than in a collateral; the occurrence at times of epilepsy and asthma among the relatives. The personal study reveals often a young adult of highly strung, intellectual, or artistic temperament. (This aspect has certainly been overstressed, for we encounter sufferers of all types of intellectual ability in all classes of the community and in all professions.) Quite often the sufferer is of the "bilious" type—i.e., one easily upset by dietetic excesses in childhood, and most characteristically one who is a poor sailor and readily becomes air-sick or train-sick. Numbers of migrainous sufferers cannot travel in trains, buses, or saloon-cars. Nothing characteristic has yet been determined as regards their appetite and thirst, their fondness or dislike for fats and sugars, &c.

Precipitating factors are extremely variable and individual. In perhaps the majority no clear-cut cause can be assigned to an attack; in some, two or three factors may be suspected; in a few only may a solitary precipitating factor be definitely traceable.

Among the commoner factors should be mentioned the psychological. Without doubt, the factors of suppressed rage and humiliation were operative in determining some of the attacks in certain of our patients. Prolonged stress of a psychogenic character is important, and the victims suffer intensely during a period of mental overwork and anxiety. Dietetic factors are rare, though we have encountered examples where the attacks have been invariably precipitated by a particular foodstuff. Over-eating may be responsible at times. On the other hand, hunger was found to be a commoner and more potent cause. The missing of a meal in the course of a busy day, unwonted exertion "on an empty stomach" are not uncommonly cited as causes of an attack. One person sustained his severest bout after deliberately avoiding food for 24 hours while continuing his usual work. The common early morning occurrence of migraine may perhaps be associated with the long period of gastric inactivity.

Physical over-exertion was blamed in a few of our cases, particularly when associated with hunger. One patient, an international rugger player, never had an attack except after a game of football. Perhaps, however, psychological factors crept in even here, because he tells us that "the attack is particularly severe when I have skippered the team; particularly if we lost the game; and particularly if I felt that the team did not play up as well as they should." The psychologist may well read the factors of "baffled humiliation and rage" between these lines.

Menstruation is, of course, an important precipitating factor, even in those women whose migraine is not of the menstrual type.

Eyestrain may at times be traceable in the immediate ætiology, and the front seats at a cinema, reading in badly lit rooms, or microscopy may occasionally be blamed.

Among the many circumstances which predispose to an attack, though not actually producing one, may be mentioned defective ventilation, smoke-laden atmospheres, exacting brain-work, particularly under circumstances of stress or worry, late hours, broken and insufficient sleep, and intercurrent illness.

*(To be concluded)*

# TUBERCULOSIS IN CHILDHOOD

## ITS ÆTIOLOGY AND PROGNOSIS AS SHOWN BY THE STOMACH LAVAGE METHOD OF OBTAINING TUBERCLE BACILLI *

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IN the "Handbuch der Kindertuberkulose" for 1930 the present German view of tuberculosis is set forth by Herbert Koch, Epstein, Engel, Priesel, Zarfl, Liebermeister, Weise, and others, much of the ætiology being based upon the well-known researches of Ranke.[1] It may be summarised as follows.

After the initial introduction into the body of tubercle bacilli the patient enters the primary tuberculous state, which Ranke has described as characterised by an epithelioid type of tissue reaction unaccompanied by allergy—e.g., hypersensitiveness to tuberculin. This period varies from two to ten weeks, usually averaging about six weeks. The patient may now recover completely, healing taking place by rapid calcification without the development of hypersensitiveness to tuberculin, or he may pass into the secondary state, which is characterised by the rapid development of a high degree of allergy (the intradermal tuberculin test showing a positive reaction to 0·1 c.cm. of 1/100 to 1/100,000 tuberculin). On the clinical side this "early" secondary state is often associated with loss of weight, fever, dry cough, pallor, and disturbances of the alimentary tract, while radiography of the chest may show enlargement of the hilus glands and sometimes "focal" lung reactions. At the same time certain so-called paratuberculous conditions, such as erythema nodosum, phlyctenular conjunctivitis, pleurisy, and benign infiltration of the lung (epituberculosis) are apt to manifest themselves. This early secondary allergic state may heal by resorption or may progress, breaking down the lymphatic gland defences to spread along the lymphatics or by the blood stream, and causing either metastases or generalised tuberculosis (miliary tuberculosis and caseous broncho-pneumonia). This generalised condition is described as the *late* secondary state.

When recovery from the primary or secondary states occurs, there results a degree of immunity; if reinfection now takes place, the resulting condition, known as the "third state," differs essentially from the two previous states. The high tissue immunity allows a localisation of infection to take place in the lung tissue; if the glands become involved (which is less likely) the infection is chronic, and not acute as in the primary state; fibrosis is a further evidence of high tissue resistance. This third state is adult "phthisis."

The American view, as expressed by Opie,[2] is, in the main, in agreement with that of the German school. It lays stress on the difference in the clinical picture between the tuberculosis of childhood and adult "phthisis," and makes it clear that these differences are due to a varying tissue response on the part of the individual. Opie points out, however, that the types of reaction are not dependent upon age, and that when a primary infection occurs in an adult the reaction is similar to that of the child undergoing a first infection. He considers the primary focus to be situated in the parenchyma, from which infection spreads to the corresponding hilus glands, an idea which is similar to that of the primary lung focus, as described by Ghon.[3] This conception has particular significance in this paper, since the presence of tubercle bacilli in the sputa of children in the primary state suggests a lesion in the lung tissue itself.

### OPEN TUBERCULOSIS IN CHILDHOOD

Recently one of us (W. R. F. C.[4]), in a paper on the ætiology of erythema nodosum, showed that this condition follows infection either with the tubercle bacillus or the hæmolytic streptococcus, and is associated with a hypersensitive body reaction to the breakdown products ("endotoxins") of the organism causing the infection. In 3 out of 5 patients with erythema nodosum of the tuberculous type, tubercle bacilli were found in the stomach lavage. The publication of this report, following directly upon the work of Arvid Wallgren [5] and other workers in Europe and America who have called attention to the occurrence of "open" lung lesions in childhood, shed a new light upon the ætiology of tuberculosis in infancy and childhood, which it is the purpose of this paper to discuss. At the same time a number of inquiries have been made about the technical difficulties, value, and practical application of the stomach lavage method of sputum examination in childhood. An attempt will be made to answer these.

The stomach lavage method of detecting tubercle bacilli in sputum has been extensively used since it was first described by Meunier [6] in 1898. Many investigators have published results emphasising the occurrence of positive sputa in varying percentages of children examined. It is now evident that children in the *late secondary state* (generalised lung or miliary tuberculosis) are found more commonly than not to have tubercle bacilli in their sputa. Thus, Armand-Delille [7] claims to be able to demonstrate tubercle bacilli in 100 per cent. of such patients (see special technique in Appendix); Drucker [8] also found them in 100 per cent. of 19 infants under 1 year with definite signs of tuberculosis. Poulsen [9] found 100 per cent. of children under 1 year to be positive; Opitz [10] found them in 8 of 11 children with advanced lung lesions; Friedlander [11] obtained positive sputa in 7 out of 12 patients with tuberculous meningitis (both by culture and by guinea-pig inoculation); Opitz [12] in 7 out of 7; and we have found 3 out of 7 children with miliary tuberculosis or meningitis to have positive sputa. On the whole, the younger the child with generalised tuberculosis the easier it is to find tubercle bacilli in the sputum (Poulsen,[9] Delille,[7] Opitz [12]).

We come now to the *early secondary state*. There is evidence to show that this is also, though in a less degree, accompanied by tubercle bacilli in the sputum. Armand-Delille [13] showed that 60 per cent. of 500 children with only radiographical lung shadows to suggest the possibility of tuberculosis had bacilli present in the sputum, and that 3 out of 64 children examined simply as "contacts" were positive. Valdimar Poulsen [9] came to similar conclusions; Camille Kereszturi [14] and her co-workers in America have demonstrated positive out of

* The investigation was undertaken in the Research Department of the Hospital for Sick Children, Great Ormond-street, London, and was assisted by a grant from the Medical Research Council.

40 children with paratuberculous lesions (mainly pleurisy and phlyctenular conjunctivitis); Opitz [12] found 7 positive out of 9 children with "epituberculosis"; Wallgren [5] found tubercle bacilli in 17 out of 37 children with erythema nodosum with positive tuberculin reactions, and Philipson [15] reported the continuance of the above work by Wallgren, showing out of 96 children with erythema nodosum and positive tuberculin reactions 47 had tubercle bacilli in the sputum.

## The Present Investigation

The present report consists of an analysis of the results of the stomach lavage in 70 children and infants under the age of 11 years (Table I.). The cases have been divided into five main groups:—

TABLE I

| — | Condition. | | Total. | Positive lavage (by guinea-pig inoculation). |
|---|---|---|---|---|
| A | Paratuberculous states .. .. | | 17 | 5 |
| B | Contact cases.. .. .. .. | | 17 | 1 |
| C | Miscellaneous cases of suspected tuberculosis | Unresolved pneumonia .. .. | 4 | 0 |
| | | Bronchiectasis .. | 2 | 0 |
| | | Peritonitis .. | 1 | 1 |
| | | Intracranial tumour .. .. | 1 | 1 |
| | | Hæmoptysis (? mitral stenosis) | 1 | 0 |
| | | Asthma .. .. | 2 | 1 |
| D | Miliary tuberculosis and meningitis | | 7 | 3 |
| E | Control cases .. .. .. .. | | 18 | 0 |
| | Totals .. .. .. | | 70 | 12 |

(*a*) Seventeen children showing *paratuberculous lesions*, such as erythema nodosum, phlyctenular conjunctivitis and pleurisy, together with X ray signs of focal lung reactions or enlarged hilus shadows. Five of the 17 yielded tubercle bacilli, as shown by guinea-pig inoculation. The pigs were killed after six weeks, and it may be that had they been kept longer, or had a double lavage been used (see appendix), more positives might have been obtained.

(*b*) Seventeen *contact cases*. These were children who had been recently exposed to infection from relations with open phthisis, and who gave positive tuberculin reactions but no other evidence of tuberculosis. One of these children was positive—namely, the sister of a child with erythema nodosum, who herself had had a positive stomach lavage. Both children were in contact with a brother who had phthisis (see history in section 2).

(*c*) Eleven *miscellaneous cases* suspected of tuberculosis in the wards of hospital by the physicians in charge. Three of these, a child with an intracranial tumour, a child with asthma, and a child with abdominal tuberculosis were positive.

(*d*) Seven cases of *generalised tuberculosis*. Three of these were positive.

(*e*) Eighteen *control cases*, consisting of children in whom there was no reason to suspect tuberculosis, most being negative to tuberculin. All gave negative results.

In Table II. the positive cases are set out in greater detail. The oldest child is 10 years, and the youngest 3 months; in fact, age seems to play little part in our results. It is interesting to note that the report of the radiologist (made independently) suggests an abnormal condition in every case, but does not always suggest tuberculosis. Our positive results occurred chiefly among children with paratuberculous lesions, as in the American investigation.[14]

Dr. Stanley Griffith, Cambridge, has been kind enough to type the last nine cases for us. Tubercle bacilli in all but one case were found to be human; the one bovine occurred in a child with abdominal tuberculosis.

TABLE II

| No. | Disease. | Sex. | Age in years. | Mantoux. | Guinea-pig result. | Type. |
|---|---|---|---|---|---|---|
| 1 | Erythema nodosum .. | F. | 5 5/12 | + | + | — |
| 2 | " " .. | F. | 3 4/12 | + | + | — |
| 3 | " " .. | F. | 7 | + | + | — |
| 4 | " " .. | F. | 10 | + | + | Human. |
| 5 | " " .. | F. | 2 9/12 | + | + | " |
| 6 | Intracranial tumour .. | M. | 5 | + | + | " |
| 7 | Asthma .. .. .. | F. | 6 6/12 | + | + | " |
| 8 | Caseous broncho-pneumonia | F. | 1 1/12 | + | + | " |
| 9 | Tuberculous meningitis .. | M. | 2 | + | + | " |
| 10 | " peritonitis .. | M. | 3/12 | + | + | Bovine. |
| 11 | " meningitis .. | F. | 6/12 | + | + | Human. |
| 12 | Contact .. .. .. | F. | 5 6/12 | + | + | " |

The following two case reports illustrate several important points. Case 1 shows the importance of the recognition of erythema nodosum and other paratuberculous conditions as clinical evidence of primary tuberculosis, and the need in such circumstances of search for the source of infection. Case 2 demonstrates the value in diagnosis of the lavage method in doubtful cases of tuberculosis in childhood.

CASE 1.—Aged 10. Admitted to the Hospital for Sick Children, Great Ormond-street, with erythema nodosum. Family history: no history of contact with tuberculosis could be obtained. Personal history: acute rheumatism during the previous winter. Skin reactions: strongly positive both to tuberculin and hæmolytic streptococcal extract. Radiography: very definite hilus enlargement. In spite of the radiogram, Dr. F. J. Poynton inclined to the diagnosis of a rheumatic or streptococcal origin to the erythema nodosum. The stomach lavage, however, gave a positive sputum, proving the condition to be tuberculous in origin. Subsequently, examination of the brothers and sisters revealed the presence of an elder brother with unsuspected phthisis, with a cavity at one apex and a positive sputum; also in a younger sister, aged 5 years, stomach lavage revealed the presence of tubercle bacilli. In the latter physical signs were absent, radiography was indefinite, and the only symptoms were loss of weight, though the Mantoux reaction was strongly positive.

This family demonstrates the importance, first, of the recognition of the significance of the paratuberculous conditions, and then of a thorough search for the source of infection.

CASE 2.—Aged 6. Admitted to the hospital suffering from asthma. She was suspected of being tuberculous because of her poor general condition, a family history of phthisis, and a history of tubercle bacilli being found in her sputum two years previously, on one occasion, in Brompton Hospital. Clinical examination and radiography were uncertain. Mantoux positive. Tubercle bacilli were cultured in the guinea-pig from the stomach washout.

## Discussion

### THE SIGNIFICANCE OF THE OPEN LESION

The results reported here, together with those of Armand-Delille, Wallgren, Opitz, et al., may be taken as proof of the existence of tubercle bacilli in the sputum of certain children. The percentage frequency with which positive sputa occur in the *primary* and *early secondary* states cannot as yet be exactly gauged. It is possible that most children passing through these states develop, for a short period, an open lesion. Wallgren's [5] observation that tubercle bacilli disappear from the stomach lavage in from two to eight months suggests that the period during which the lesion is open is of such comparatively short duration that it is unlikely to be detected, unless the condition is revealed by paratuberculous lesions. In our investigation all but one of the children with early lesions from whom tubercle bacilli were obtained revealed their condition

to us by the coincident occurrence of erythema nodosum or phlyctenular conjunctivitis. The American figures [14] also showed a high incidence among children with paratuberculous lesions—i.e., 30 per cent. in children with, compared with 12 per cent. in children without—while it is significant that Wallgren [5] found 46 per cent. of his children with erythema nodosum to have open lesions. It is, however, quite clear from the results of other workers (Opitz,[12] Armand-Delille,[13] Poulsen [7]) that open lesions occur frequently among children with primary tuberculosis in the absence of paratuberculous lesions. It should not, therefore, be thought that open lesions are necessarily more common in children in whom the primary tuberculous state is associated with paratuberculous lesions, but rather that in these children they are more easily detectable.

The point of origin of these tubercle bacilli cannot be determined with certainty, since these children do not come to autopsy. The work of Ghon,[3] Blacklock,[16] and others, and some of the focal reactions demonstrated by Melville [17] in fine skiagrams suggest, however, that the primary lesion is in the lung parenchyma, and we may hazard the suggestion that the sequence of events is usually as follows: the child inhales tubercle bacilli, which are caught in the parenchyma of the lung; after some six weeks a focal reaction occurs in the lung and later in the glands draining the affected area; at this time tubercle bacilli may be found in the sputum in small numbers; two to four months later healing may take place by resorption, and the open lung lesion close so that tubercle bacilli can no longer be found in the stomach lavage. At present there is little evidence as to the actual frequency of these events. We may, however, quote the words of Armand-Delille, "Il semble que la lésion tuberculeuse est chez l'enfant plus souvent ouverte qu'on ne le pense classiquement."

### THE PROGNOSIS OF CHILDREN WITH OPEN LESIONS

The question of prognosis in children who are shown by this method to have open lung lesions has not yet been completely settled. It is interesting to note that Bentley,[18] in an article on tuberculosis, recently stated that it is a "medical curiosity" to find a positive sputum in a child below the age of 10 years, and that when this does occur the prognosis is extremely grave. He was, of course, alluding to the bacilli found in the sputum by ordinary methods, and, as Armand-Delille [13] has shown, tubercle bacilli are only found in this way in gross lung lesions. It is, however, well known that children swallow their sputum, and we wish to make it quite clear that this sputum may contain tubercle bacilli from two different tuberculous conditions, those of the early localised and those of the late generalised secondary states described above. It is evident that many of the children in the late secondary state, where the infection is generalised and the prognosis hopeless, may be found to have tubercle bacilli in their sputum in sufficient numbers for detection by the ordinary method (direct microscopy of expectoration); to this extent we are in agreement with Bentley.

But it is to the existence of the early secondary state, where tubercle bacilli are not found in the sputum by the ordinary method, that we wish to call attention. The prognosis in these children, in our investigation, was good, and in fact no worse than in those in whom it was impossible to demonstrate bacilli. In from 6 to 14 months subsequent to the first positive stomach lavage none of our children have shown general symptoms of the disease, and in a follow-up of some 24 cases of paratuberculosis (erythema nodosum and phlyctenular conjunctivitis) occurring during the last four years at the Hospital for Sick Children, only three were found to have developed any frank tuberculous lesion. Other writers have given varying prognoses; the Norwegian, Engelsgaard,[19] quoted as high a figure as 50 per cent. of the cases developing frank tuberculosis after erythema nodosum; the Americans [14] stated that the children with positive lavage did only slightly less well in the Seaview Sanatorium, New York, than those with negative lavage; Wallgren [5] and Philipson [15] showed that bacilli disappeared from open lesions in Swedish children in from two to six months. It may be said that the prognosis varies with the treatment; all the children from this hospital were carefully supervised, and most of them went away for prolonged convalescence.

In this connexion the work of Borrel [20] on the French African troops in the war is of considerable importance. He showed that these men, who had not previously been exposed, and who came into contact with tuberculosis on arrival in France, reacted to the disease in a similar way to the European child. After the primary infection there was a period of three to four months during which they showed loss of weight, slight fever, alimentary disturbances, increased hilus shadows in the X rays of the chest, and strongly positive tuberculin reactions. At the end of this period they either recovered without further symptoms or the disease became generalised. The prognosis appeared to depend largely upon the treatment afforded during the three months subsequent to the primary infection. If during this period they were taken off heavy duty, given ample diet and rest, the prognosis was extremely good; if, however, they were allowed to continue the full rigours of a soldier's life the disease tended to overcome the body defence and generalise. Fuller investigations are necessary before it will be possible to gain a clearer idea of the prognosis of children with primary tuberculosis showing positive sputa; we may submit, however, that there is reason to suppose it to be good, provided suitable environment, food, fresh air, and rest are secured for them.†

The action to be taken in respect of these children necessarily raises the question of infectivity. There is, at present, no evidence that these children are infective; there is no known instance of one child with erythema nodosum having caused any other child to become infected, and in the school outbreaks of erythema nodosum in Scandinavia recorded by Albin Landau,[21] all the cases were traceable to one older child with open phthisis. It seems unlikely that sputum, which can only be obtained by special technique from the stomach, will ordinarily be a source of infection. There remains the possibility, as Philipson,[15] Valdimar Bie,[22] and Opitz [12] have emphasised, that during fits of violent coughing or sneezing in children with bad colds or coughs,

† Since writing the above, Dr. J. W. S. Blacklock's report [16] has been published by the Medical Research Council. This investigation deals with 1800 consecutive post-mortems on children. Of these, 283 showed tuberculous lesions and 173 were considered to be due to primary tuberculous infections of the thoracic tissues; 90 per cent. of those cases which came to autopsy did so directly due to their tuberculous infection. This fact, combined with the comparative rarity of finding similar lesions at adult autopsies, has led Dr. Blacklock to assume that pulmonary tuberculosis is almost always fatal in the west of Scotland. This is a very different finding from our own and others quoted here, and suggests that there is something particularly unfavourably in the environment of Glasgow children acquiring tuberculous infection. It must be remembered, however, that he is approaching the subject purely from the pathological standpoint, and hence his results may not be altogether comparable with ours.

particularly whooping-cough, the bacilli may be expectorated. The elucidation of this point requires further study. At present we feel that these children should be treated as non-infective, and probably the ideal place for them to enter after prolonged convalescence is (in those above 3 years of age) the open-air school.

### CONCLUSION

In conclusion, we submit that the recognition of the primary state, with its open lesion capable under correct treatment of early healing, is of the very greatest importance. We should like to emphasise the necessity for regarding all children with erythema nodosum, phlyctenular conjunctivitis, pleurisy, or benign infiltration of the lung (epituberculosis) as probably having open lung lesions. In the absence of any paratuberculous lesion, the diagnosis of the primary state remains very difficult, and can only be made by combining radiographical examination, skin reactions, a consideration of the general clinical condition, and the history of contact with open phthisis.

## Appendix

### INVESTIGATIONS BY PREVIOUS WORKERS

The following is a brief summary of reports already mentioned.

1. *Armand-Delille*,[7] of Paris, in 1927, examined directly homogenised stomach lavage—i.e., not cultured in the guinea-pig—and found 34 positives in 110 children suspected of tuberculosis. He divided his cases as follows: (*a*) Thirteen children with obvious clinical and radiographical evidence of tuberculosis—all positive. (*b*) Thirty-three children with only radiographic evidence—18 positive. (*c*) Sixty-four children examined as contacts—3 positive. (No ages given, no mention of paratuberculous lesions, no details of cases.) In 1930 he published[13] the results of the three following years' work. He says that in 500 cases the tubercle bacillus could be demonstrated in 100 per cent. of children with physical and radiographical signs of caseous bronchopneumonia, and in 60 per cent. of children with radiographical shadows suggesting tuberculosis. (No ages given, no mention of paratuberculous lesions, no details of cases.)

2. *Poulsen*,[9] of Copenhagen, in 1931, was able to demonstrate tubercle bacilli from stomach lavage injected into the guinea-pig in 53 out of 110 children. These children he arranged into age-groups, with the result that of 62 children below the age of 3, 41 were found to have open lesions, while of 48 over the age of 3, only 12 were positive. Poulsen is careful to explain that in Copenhagen all children under the age of 3 suspected of tuberculosis are sent to the children's hospitals, while those over 3 go to special tuberculosis wards; in this way he accounts for the discrepancy in age results. Poulsen found that in the cases of 19 infants below the age of 1, 100 per cent. had tubercle bacilli in the sputum. He cites cases in which a definite diagnosis could only be made by this method. (No mention of paratuberculous lesions.)

3. *Drucker*,[8] of Copenhagen, in 1930, showed that in 19 children under 1 year of age who had a positive tuberculin skin reaction and radiographic shadows in the lungs, all had virulent tubercle bacilli in the sputum, obtained by stomach lavage.

4. *Wallgren*,[5] in 1931, demonstrated tubercle bacilli by stomach lavage and guinea-pig inoculation in 17 children with erythema nodosum out of 37 who had positive Mantoux reactions. He made the important observation that the sputa became negative, as shown by repeated examinations, in two to eight months.

5. *Philipson*,[15] in 1932, reported on the continuance of the above work by Wallgren after 100 children with erythema nodosum had been examined in this way. His results showed that of 96 who had positive Mantoux reactions, 47 were found to have tubercle bacilli in the sputum. His results have been graded into three groups depending on the increase of hilus shadows, with the result that group 1, with the smallest shadows, had 27 positive per cent.; group 2, 43; and group 3, with the largest hilus shadows, 73 per cent. He also showed that the average length of time that the lesions remained open was two to six months.

6. *Opiz*,[10] in 1928, demonstrated the superiority of guinea-pig culture of stomach lavage material, and other fluids over direct microscopy or culture on Petroff's medium. In 33 sputa, 25 per cent. were positive by direct microscopy, 50 per cent. by Petroff culture, and 66 per cent. by guinea-pig culture. In 11 cerebro-spinal fluids from tuberculous meningitis, 60 per cent. were positive by direct microscopy, 64 per cent. by Petroff, and 100 per cent. by guinea-pig culture. In 6 pleural or peritoneal fluids none was positive by direct microscopy, or by Petroff, and 5 by guinea-pig culture.

Opitz,[12] in 1930, demonstrated tubercle bacilli in the stomach lavage by guinea-pig culture in 28 out of 30 cases of benign infiltration (epituberculosis) of the lung, in 1 out of 7 children with "interlobar pleurisy," in 3 out of 24 with "hilus tuberculosis," in 7 out of 7 with tuberculous meningitis, in 2 out of 6 with tuberculous knees, and in 1 out of 3 with enlarged cervical glands. In his children with epituberculosis he demonstrated bacilli at intervals of a few months for varying periods up to 2 years. Out of 42 positive results he only obtained 2 above the age of 4 years. Opitz considers the question of the infectivity of these children, and says that they may be infective during periods of severe cold or cough; he considers, however, that it would be a great mistake to expose them to superinfection by isolation with cases of phthisis.

7. *Kereszturi*[14] et al, in America, in 1932, examined 40 children in this way, all of whom were suspected of tuberculosis, and the majority having radiographic changes in the lungs. Seven of the 40 had tubercle bacilli in the sputum from stomach lavage, as follows: 2 in pleurisy with effusion; 1 in pleurisy and phlyctenular conjunctivitis; 2 in interlobar pleurisy with infiltration; 1 in central infiltration; 1 in spondylitis.

They point out that most of their positive cases had some paratuberculous lesion, though this in the case of interlobar pleurisy and central infiltration was only diagnosable by X rays. It was significant that 3 children with paratuberculous lesions, diagnosable without the use of X rays, gave positive results out of 10 such children, and that only 1 positive was obtained from a child who had no paratuberculous lesion whatever out of 30 such children. The average age of positive results was given as 4·4 years.

8. *Friedlander*,[11] in 1930, in Germany, examined the gastric lavage of 12 children with tuberculous meningitis. The sputum was grown on Petroff's medium, and also cultured in the guinea-pig. In 7 out of the 12 tubercle bacilli were found.

9. Bie,[22] in a small investigation on 12 children, Pirquet-positive, found 4 to yield tubercle bacilli in the stomach lavage grown on Petroff, and injected into the guinea-pig. All 4 of the children were below the age of 5 years. A number of Pirquet-negative children were all found to have negative stomach lavage.

### TECHNIQUE OF THE STOMACH LAVAGE

This method, first described by Meunier in 1898, consists in making the child cough first thing in the morning, before any food has been taken, and then washing the stomach out with 200 c.cm. of normal saline. The centrifuged deposit is then injected into the guinea-pig, and the animal later killed for evidence of tuberculosis.

We have somewhat modified this technique, and now use the following:—

1. Two grains of potassium iodide are given three times a day for two days before the lavage.
2. The child is encouraged to cough first thing in the morning for 20 minutes.
3. He is then given 100 c.cm. of boiled water to drink.
4. Fifteen minutes later a stomach-tube is passed and as much fluid as possible withdrawn from the stomach.
5. This fluid is centrifuged and the deposit is treated with 1/10 antiformin (4 c.cm. diluted antiform being added to 100 c.cm. lavage).

More recently we have used a method suggested by Dr. S. Griffith, which consists in adding a 10 per cent. potassium hydroxide solution to the stomach lavage to make a final dilution of 1 per cent. This is allowed to act for an hour and then the whole is centrifuged. This method has the advantage of ensuring that the tubercle bacilli are not destroyed, but has the drawback that it leaves the deposit too thick for direct examination.

6. It is then injected under the skin in the abdominal region of the guinea-pig.
7. The guinea-pig is watched for six weeks, after which it is killed and examined for tuberculosis, both by direct smear of the diseased glands and by culture.

Dr. Stanley Griffiths thinks that guinea-pigs which do not show clinical evidence of tuberculosis should be left at least three months; if they die or are killed within six to eight weeks, cultures should be sown from the glands adjacent to the seat of inoculation, even when no lesions are visible. Opitz [10] says that when there were certain signs of tuberculosis he killed the pigs in five to six weeks, and that otherwise he left them for three months, and he also says [12] that he found it useful to test his guinea-pigs with tuberculin; those yielding positive skin reactions were killed at once—i.e., at the most after four to six weeks. Those negative he kept for three months before killing. We were only able to keep our guinea-pigs for six weeks, and it is possible that we may have missed a few positives. It is also of interest that Philipson has shown that by using the material from lavage on two successive mornings he was able to increase slightly the number of his positives.

The above method is comparatively simple, but requires the coöperation of a ward sister used to the handling of children. Herein lies a somewhat variable factor.

Armand-Delille has suggested a different technique which allows an immediate diagnosis if the finding of acid-fast bacilli is considered sufficient proof that the organisms are tubercle bacilli. The sputum contains so few organisms that a method of reducing the size of the centrifuged deposit by getting rid of as much of the mucus as possible is necessary before the bacilli can be seen in the direct smear. This he does by homogenisation as follows:—

1. Centrifuge the lavage in four tubes.
2. Place precipitates in porcelain dish containing 50 c.cm. of water.
3. Add 10 drops of normal sodium hydroxide solution.
4. Heat for ten minutes while slowly adding 50 c.cm. of water.
5. If specific gravity is over 1004 add a little alcohol.
6. Centrifuge liquid again for 45 minutes.
7. Stain by Ziehl Neelsen and examine for tubercle bacilli.

### THE VALUE OF STOMACH LAVAGE

Little difficulty has been experienced in obtaining sputum by this method from every child. The majority of children appear to be excreting some small quantity of sputum, and this is normally swallowed. The technique of culture in the guinea-pig presents no great difficulty to the pathologist. Unfortunately at present the culture requires at least six weeks, and this, in many instances, robs the result of clinical value. Recently, however, Armand-Delille [13] has demonstrated tubercle bacilli in direct smears of the sputum obtained by stomach lavage using a different technique, while Ninni [25] is claiming that the injection direct into a cervical gland allows the diagnosis to be made in a week. In this present investigation we made use only of the method of guinea-pig inoculation.

The value of the test is very largely in its definiteness: a positive result means definite tuberculosis. All other methods of diagnosis—e.g., clinical examintion, radiography, tuberculin reactions, &c.—however they may incline us to suspect a tuberculous condition of the lungs, fail to supply absolute proof. Delille [13] is emphatic on this point, and says:—

"On ne saurait affirmer, en effet, qu'un enfant n'a pas de lésion pulmonaire tuberculeuse si on n'a pas fait cet examen; nous considérons même qu'on lui devrait accorder autant d'importance qu'à la radiographie."

We think, also, that the very great delicacy of the test should be emphasised. Armand-Delille [13] was able to show that direct examination of sputum obtained by tickling the back of a child's throat, did little more than demonstrate tubercle bacilli in cases of gross lung lesion—e.g., caseous broncho-pneumonia. His figures for direct examination of material from stomach lavage showed a greatly increased range of positive results; his final method of homogenisation again increased this range, so that it was now evident that the presence of even a few bacilli was being detected. From the work of Wallgren [5] and Opitz [12] it would appear that guinea-pig culture is a test of even greater delicacy, and it is certain that this last method, which we have adopted, may reveal the presence of bacilli in extremely small numbers. The superiority of guinea-pig culture over direct microscopy or growth on Petroff's medium is evidenced by the figures of Opitz [10]: in 33 cases of suspected lung tuberculosis 25 per cent. were positive by direct microscopy, 50 per cent. by growth on Petroff's medium, and 66 per cent. by guinea-pig culture. Opitz says:—

"Wir sehen also dass das Kulturverfahren noch dann zum Nachweis von Tuberkelbazillen furhen kann wenn die mikroskopische Untersuchung in Stich lasst."

So far as we have been able to judge, the test is reliable; a positive result would seem to be proof of tuberculosis, as in no instance did a control case yield a positive result, and such autopsies as were obtainable in children who died in the secondary state revealed a primary focus in the lung parenchyma.

A negative result does not mean that tuberculosis is absent unless the lavage has been repeated several times, since the practical difficulties in obtaining the sputum by this method allow a considerable margin of error.

We may, therefore, say of the method that its definiteness, together with its delicacy and reliability, justify its use in any case of suspected lung tuberculosis in which a diagnosis is required.

We wish to express our gratitude to Dr. Stanley Griffith for his help and encouragement throughout this work. Our sincere thanks are due to the staff of the Hospital for Sick Children, Great Ormond-street, for allowing us to use and publish the cases here quoted. We also wish to thank Prof. T. W. T. Dillon for his help and advice with some of the foreign literature, and Mr. J. A. Swan for his technical assistance.

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# HIGH BLOOD PRESSURE

## THE PROBLEM OF ITS CONTROL

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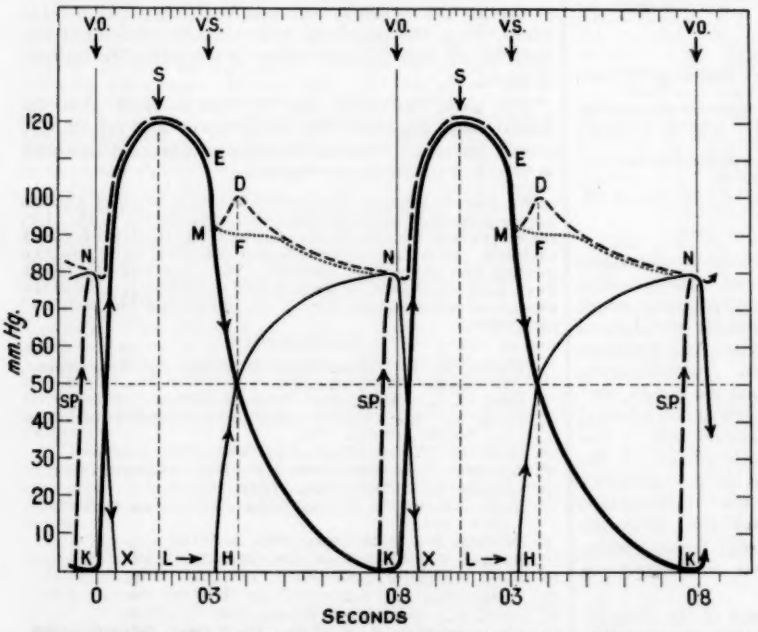
WHEN, with the aid of a sphygmomanometer, the practitioner has come to the conclusion that his patient is "suffering from high blood pressure," at least three questions require answering: (1) Which factor or factors among those which are responsible for normal pressure are at fault? (2) Is it possible to control the erring factor? (3) Is control justifiable?

I venture to state that, owing to the chaotic character of present-day teaching, the solution of any one of these problems presents the greatest difficulty. Many prominent clinicians have suggested that high pressure may be of a compensatory character, and as such should not be unduly interfered with, although no definite theory has been advanced in support of their views. The attitude of many practitioners towards sphygmomanometry recalls that adopted to thermometry in my early days when, if pyrexia was discovered, it had to be reduced at all costs by so-called antipyretics. Fever is now viewed as an index of the combat proceeding between the natural protective powers of the body and the noxious agent and as beneficial in itself. I shall endeavour to give definite reasons why the time has arrived when hyperpiesis should be, at least to some extent, regarded analogously.

The paper represents an attempt to show the practical utility of the theory of an arterial systole which I set forth in a recent number of this journal,[1] and I am herein assuming that such a systole exists.

The complicated nature of the interaction between the various factors which promote blood pressure may be roughly illustrated as follows. During ventricular systole the factors concerned are: (1) rate; (2) volume; (3) force; (4) general arterial volume; (5) elasticity of arteries; (6) sectional area of arteriolar-capillary junction, and the "hydraulic head" representing the resistance of the capillaries and veins beyond; (7) frictional condition and extent of arterial endothelial surface; (8) viscosity of blood. During diastole, ventricular force is replaced by the "arterial systole" assisted by the elastic recoil which takes the place of the elastic resistance, these constituting the driving force. There are, therefore, eight factors during either phase, each of which may have at any time a plus, minus, or normal value. The combinations possible through the interaction of these values amount to many thousands and suggests a problem in higher mathematics, but fortunately I am dealing principally only with the effect which the modification of one factor has upon arterial pressure.

FIG. 1




Graph depicting two successive normal heart cycles (0·8 sec.). The upper composite line, NSEMDN, corresponds to normal intra-arterial pressure.
Thick interrupted line, SPNSE = ventricular systolic pressure, reaching maximum at S and ending E. Portion SP = presphygmic rise, which does not affect intra-arterial pressure, merely serving to force valves open at N. V.O. = opening of valves. V.S. = closing of valves.
Thick continuous line = elastic pressure due to varying volume of blood. Portion K (zero) to E = while ventricle is acting. E to M = immediately after valves close. M down to K = curve resulting from added arterial muscular compression, accelerating evacuation.
Fine dotted line, MFN = course which would be taken by thick line if no muscular compression was acting.
Thin continuous line = pressure on arterial contents due to muscular coat, starting at H (zero) after latent period L→H, rising to N, where it serves to hold valves closed while SP is rising. Then dropping sharply to X (zero).
Thin interrupted line, MDN = resultant pressure curve of added muscular and elastic effects. D = dicrotic wave. M = incisura.
Note that the vertical line dropped from D intersects elastic curve at 50 mm. Hg, and the muscular at 50 mm. Hg, the total forces acting on arterial contents at this moment being 100 mm. Hg.

Fig. 1 (reproduced from my former paper) illustrates how these factors coöperate. The "general volume" is for practical purposes taken as zero or the base line. The elastic tension depends on the contained volume, so the space between the line KSMK and the base may represent the "excess" volume at any moment. As the total systolic volume would not be evacuated without the assistance of HN in 8/10 sec. (according to my hypothesis) this could be represented by prolonging the line KSMFN to the right until it cuts the base line at the expiration of the time which a simple unaided elastic artery would take to dispose of all the added volume. The space between this line and the base might then be regarded as the total excess volume injected during systole. Its insertion would make the diagram too complicated. The "resistance" which comprises the three factors 6, 7, 8 will determine the position of the point N on V.S., so N may be taken as its index for practical purposes. It is obvious that any one of the three can therefore affect the pressure.

### PECULIAR PROPERTIES OF ARTERIES

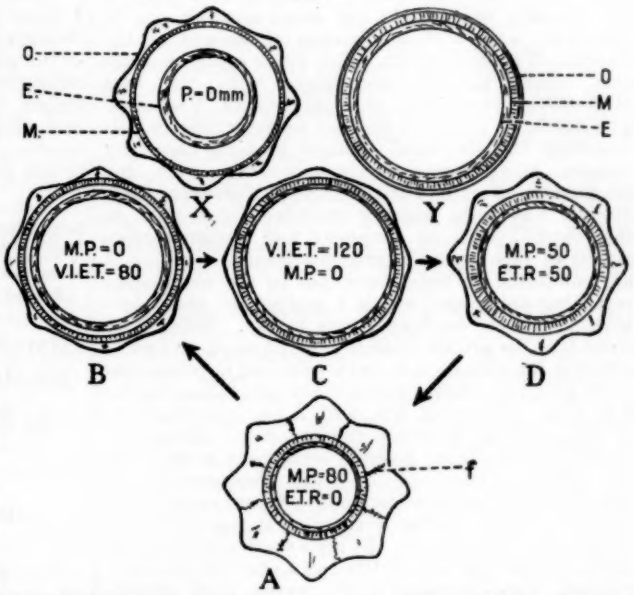
An artery may be considered to be made up of three tubes ensheathing each other—viz., inner elastic, middle muscular, and outer fibrous. Each tube has its own distinct physical part in the hydrodynamics of the circulation. Fig. 2 represents transverse sections of these "tubes" in their different stages of activity during the cardiac cycle. Figs. 1 and 2 are complementary to one another, and should be compared as my argument proceeds, especially as some of these stages do not follow the conventional lines but those of my former paper.

An elastic tube has its smallest diameter when fully relaxed. The amount of force available on recoil is practically equal to that required to distend it to any given diameter, and therefore depends on its contained volume at any time and the "quality" of its elasticity; otherwise it is inert. A muscular (involuntary) tube has its smallest diameter when fully contracted and its largest when relaxed, unless stretched. It is peculiar that if such a tube, when contracted, be forcibly dilated, it will suddenly relax. But if slowly stretched it will relax pari passu with the stretching force, or may even resist it. If it be *suddenly forcibly* stretched it will violently contract. Thus while an elastic tube will be always exerting pressure on its contents when above its normal diameter, a muscular one may be either compressing its contents or be completely relaxed, and have the same diameter in both cases. When contracting over an elastic tube its force will be added to the elastic tension (if any), but if the contraction pressure relaxes, step by step, with increasing distension of the inner tube, it may offer no resistance nor add to the distensile force necessary, as would be the case if it were made of elastic material.

Fig. 2, X represents an artery with all its coats relaxed and its contained blood at zero pressure. The outer sheath is shown as an undulating line to indicate "slackness." Actually, of course, this puckering takes the form of transverse, not longitudinal ridges. Y is a vessel dilated to its maximum, which probably never occurs, as it would then function as a rigid tube, the outer coat being taut and acting like the network of cord which surrounds the second bulb of a perfume spray to prevent it from bursting. A is the state of affairs (shown in Fig. 1 at N) when the valves are about to open at the end of diastole. The inner tube is fully relaxed, as at X, and exerts no pressure, while the middle one is firmly contracted round it with a pressure of, say, 80 mm. Hg (Fig. 1, N on line HN). The next stage is B, immediately after the valves have opened, the middle coat relaxing, and the inner distended by ventricular systole up to 80 mm. (Fig. 1, between K and X). From now pressure rapidly rises to its maximum at C. The middle is stretched preparatory to the onset of its succeeding contraction. The elastic tension is, say, 120 mm., and the muscular pressure nil (Fig. 1, S). In D the middle is contracting on the inner, both pressures being equal and totalling 100. This is shown on Fig. 1 as the moment of the summit of the dicrotic wave D. The middle coat from now onwards helps to squeeze forward the blood, assisted by the elastic tension, until the position at A is reached once more; arterial volume is zero, and the inner coat is relaxed, so far as its elasticity is concerned.

There is also a peculiarity about the tissue intervening between the coats or "tubes." That between the inner and middle is areolar and non-elastic, whereas elastic fibrils are present between the outer and middle, running more or less horizontally across (A f). The only function I can assign to the fibrils is to assist the muscular coat to relax, as they would be useless otherwise unless concentrically arranged, like the inner coat. When the tunica media is contracted, they would be extended, as one end of the fibril is anchored to the external tough fibrous coat which in its turn is attached to the tissues contiguous to the artery. The other end is fixed to the periphery of the middle coat. On relaxation of the muscle, therefore, the recoil of the fibres would pull the circumference of the muscular coat outwards, assisting in its rapid relaxation, for instance when urgently required between stages A and B. This seems to be another point in favour of my views on an arterial systole.

FIG. 2




E.T.R.= elastic tension recoil. M.P.= muscular pressure. V.I.E.T.= E.T. due to ventricular injection. O., M., and E.= the three arterial coats (outer muscular, and elastic).

The general clinical conception of high pressure is that it necessarily depends solely on the amount of distension set up in the arterial walls and the quality of the elasticity, whereas, if the state of affairs represented at Fig. 1, N, or Fig. 2, A, is considered, this cannot be correct. During the whole of diastole, pressure may be due partly to muscular compression and partly elastic. Hence, if diastolic pressure be hyper-normal, both these factors must be taken into consideration. If diastolic pressure be raised, systolic must follow suit, and the muscular factor becomes one of great importance. For instance, suppose that an artery is over-distended during diastole to a pressure of 200 mm. Hg, and is in danger of rupture, it is an obvious advantage for its inner coat to be embraced by a muscular one capable of rhythmically contracting with a force, say, of 50 mm., which would thus reduce the strain upon the inner by this amount, and assist in the propulsion onward of its blood. But the effect of this would be to raise the intravascular pressure momentarily to 250 mm.; in other words, a clinical diastolic pressure of 250 mm. due to the combined effect is quite a different affair to one of 250 mm. arising from distension alone. Therefore, if a vago-depressant drug were to be given in the former case, it would aggravate the condition by handicapping the muscle. This can also be illustrated by lowering the curve HN on the graph, which would result in MK falling more gradually, so as to cut the vertical V.S. above zero, so entailing more ventricular force at the succeeding cycle in order to overcome the now distended artery, if the same volume is to be injected. In other words, pressure must rise.

I presume that I have made it clear that this muscular contraction has nothing in common with that very vague state of affairs denoted "spasm of the peripheral arterioles" which, text-books aver, sets up high pressure. Patients suffering from hyperpiesis may be divided into two classes. In one there is evidence of organic pathological change in the vascular tissues; in the other nothing can be found, at least with any means at present at the disposal of a practitioner. This latter group includes that which has, in accordance with the best professional traditions, been christened "essential hypertonia." I do not propose to enter into details regarding the structural changes brought about by disease, being here mainly concerned with the mechanical effect of such changes. Moreover, Prof. Plesch [3] has quite recently provided the readers of this journal with an excellent and comprehensive review of this aspect of arterio-sclerosis, in which, I am comforted to note, he comes to the conclusions regarding treatment which I arrived at years ago, when they were considered rank heresy. Suffice it to state that, in arterial disease, the physical or hydrodynamic function of each coat is impaired in proportion to its progress. Impairment of the musculosa implies a gradual lowering of HN, with a corresponding rise in MK, and as a result the general "distensile" pressure rises. What possible benefit can result from the administration of a "vago-depressant" or muscular paralysant under such circumstances? On the other hand, giving a vascular stimulant is like whipping a dying horse. In my experience, from the point of view both of effectiveness and of the patient's comfort, vago-depressants are worse than useless, at the most bringing about a temporary fall due to a general increase in the capacity of the circulatory "viscus."

### ESSENTIAL HYPERTONIA

In essential hypertonia the conditions are somewhat different. Here I should feel inclined to name viscosity as the erring factor. One of the commonest cases of this type met with in general practice is climacteric hyperpiesis. I do not know whether systematic investigation has been made of the viscosity in these cases; if not, it might prove instructive. Where the red count is high, pressure often, if not always, follows suit; why not also the white? or both? While viscosity depends on the serum as well as the corpuscles, the former varies but slightly compared with the latter. It is significant that the normal variation of cat's blood, which has a viscosity three times that of water, may be 2·2 to 4 times.[4] Such variations may account for the familiar changes in the normal pressure readings during the day. Friction being inversely proportional to the velocity, and the rate of flow directly proportional to the driving power, it follows that, with increased velocity, greater driving force during diastole or systole will be required to overcome the resistance. At the "climacteric," muscular excitability is well known, hence the arterial muscular response to the stretching stimulus may be increased. Consideration of the graph will show that increased HN against increased resistance can reduce the arterial calibre to zero if HN be sufficiently high. Even if the latter remain only at its normal value, it will be of much service in controlling the distensile pressure which would in such a case certainly tend to rise. In both cases internal pressure at N would therefore be above normal (taken as 80 mm.). Thus in two cases, each with a clinical pressure of, say, 120 mm. at N, in that due to tunica media disease the formula might read for the pressure at N: musc. 40+elast. 80=120. For abnormal viscosity: musc. 80+elast. 40=120. Or again, if HN is sufficient to overcome R, which at N is 100, then musc. 100+elast. 0=100; normal being musc. 80+elast. 0=80. Thus in increased viscosity there are definite contra-indications to the exhibition of vago-depressants.

Therefore, summarising, I submit that the reasons I have given are sufficiently definite to enable me to state that in no case should the compressive power of the middle coat be artificially lowered or stimulated thoughtlessly, and that a careful distinction should be drawn between pressure due to rhythmic arterial muscular compression, and that due to simple elastic tension; and the respective shares which they have in the production of "high blood pressure."

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3. Plesch, J.: THE LANCET, 1932, i., 385, 641.
4. Bayliss, W.: Proc. Roy. Soc. B., 1916, lxxxix., 380.

Egham.

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# IMMUNISATION OF THE MALTESE GOAT BY MEANS OF CUTANEOUS VACCINATION

BY SIR THEMISTOKLES ZAMMITT, C.M.G., M.D.

AND

J. E. DEBONO, M.D.

*(From the Public Health Department, Valetta)*

IN a previous communication [1] under this heading we expressed the hope that a continuation of our observations would point the way to an effective protection of our goats against *Brucella melitensis* infection—the basis of our conclusion being the fact that we had succeeded in vaccinating a number of our goats to the point that they were able to withstand the subcutaneous injection of a virulent culture of *Br. melitensis* without developing an infection.

The favourable consideration of our report (which was embodied in the paper referred to) by H.E. the Governor of Malta was followed by his minute of Jan. 30th, 1931, authorising the continuation of our investigations, in consonance with which we recommenced work the first week of April, 1931, and carried on until the end of March, 1932.

### PREPARATION OF VACCINE

A special avirulent strain of *Br. abortus* which had lost its power of provoking the formation of agglutinins was obtained from Dr. A. F. Huddleson of the Central Brucella station of the United States of America. This micro-organism was inoculated into flasks containing two litres of Huddleson's liver broth, which were then incubated (aerobically) for 28 days at 37° C., the resulting culture was filtered through a Chamberland candle, and the filtrate tested for sterility.

To ensure that this filtrate contained a sufficiency of the substance termed by Besredka "anti-virus," 20 c.cm. were transferred to a separate flask, and after the pH had been readjusted to 6·8, reinoculated with the original strain of *Br. abortus* and incubated aerobically at 37° C. For the next consecutive 15 days, 1 c.cm. was plated out daily on to agar. If *Br. abortus* failed to develop in the plates on any of these occasions, the filtrate was considered suitable for our purpose. The remainder of the sterile filtrate was then used to wash off the surface growth of *Br. abortus* from three-day-old agar tube cultures, in the proportion of 10 c.cm. to each tube.

This emulsion constituted the final vaccine which was put up in 2 c.cm. ampoules for use as required.

[1] THE LANCET, 1930, i., 1343.

### METHOD OF APPLICATION

Four separate 1 c.cm. doses of vaccine were injected *intradermally* into the udders of each goat. At the same time the udders and the mouth were sprayed with the vaccine. These procedures were repeated a week later.

No clinical reaction was noticed; the goats continued to feed and to milk normally. The outstanding advantage of the method is that no agglutinins are developed in the serum as the result of the inoculation; consequently, if a positive serum reaction occurs subsequently in a vaccinated animal it must be due to a definite infection.

We had always in mind the probability of goats becoming infected through contact with infected animals, whose excreta, loaded as they usually are with *Br. melitensis*, are in fact bound to contaminate the food and the locality, and thus there is ample opportunity afforded for the specific microbe to gain an entrance through the abraded skin of the healthy animals. The importance of ascertaining the truth of this assumption by practical test is obvious.

Our first step, therefore, was to select 11 healthy goats that had been kept a long time under observation and vaccinate each by our improved method, and then to evaluate the resistance of these vaccinated goats against the chances of natural infection as compared with non-vaccinated animals under the same test conditions.

With this end in view we formed a herd comprising the 11 vaccinated goats and 25 goats condemned by the sanitary authorities as infected with *Br. melitensis*, together with 9 healthy untreated animals to serve as controls, and housed it in one of the stores at the Lazzaretto.

After 16 weeks of communal life the blood of the animals was tested for the presence of agglutinins, and it was observed that while the vaccinated goats remained negative, one of the controls showed a very definite reaction. At the end of this period this goat was killed, and on post-mortem examination it proved to be very heavily infected and all its organs yielded colonies of *Br. melitensis*.

This preliminary experiment was satisfactory in so far as it showed that we were correct in assuming that a healthy goat might become infected by mixing with diseased animals. We had also proof that vaccinated animals could mix with infected ones with relative impunity. On the other hand, it was unsatisfactory in that the number of control animals developing the infection was so small. The result, we noted, can be easily explained by the hygienic conditions under which our goats were kept.

Ordinary herds are usually huddled together in narrow and badly ventilated rooms, the floors of which are heavily littered with contaminated excreta and food. In our case the animals were housed in a large vaulted store with wide open arcades overlooking a well-lighted yard, so that in spite of our attempts to imitate ordinary conditions by keeping the goats together, the chances of infection were reduced to a minimum.

In order to test the immunity afforded by our method of vaccination still further we next proceeded to try the effect of subcutaneous inoculation of a virulent culture of *Br. melitensis*.

On Sept. 2nd two of the vaccinated animals used in the previous experiment and two untreated healthy animals as controls were each injected subcutaneously under the skin of the udders with a dose of approximately 100 millions micro-organisms.

After five days, blood-serum from the control goats showed a positive agglutination reaction in dilutions up to 1/80 and 1/320 respectively. Of the vaccinated animals, one remained completely negative and the other yielded a weak positive reaction in dilutions up to 1/40.

The milk from each of the four goats was repeatedly examined, and numerous colonies of *Br. melitensis* were constantly obtained from the milk of the reacting control goats. In the case of the vaccinated goats, the one with the negative reaction never showed any growth of *Br. melitensis*, whilst the other on one occasion yielded two colonies.

At the end of 62 days all the animals were killed. At the post-mortem examination both of the controls were found to be heavily infected, *Br. melitensis* being isolated from the udders, inguinal glands, and spleen; whilst in neither of the vaccinated goats could any evidence be obtained of melitensis infection.

The subcutaneous inoculation of a virulent culture is admittedly a severe test of immunity and one on an altogether different plane from that afforded by the chances of natural infection; and yet even so the vaccinated goats showed a high degree of resistance. It seemed desirable, therefore, to utilise some other method of infection, midway in severity between actual inoculation with a virulent culture and exposure to natural contagion.

Further, as it has already been shown (Eyre, McNaught, Kennedy, and Zammitt,[2] Zammitt[3]) that the kids dropped by infected dams possess sufficient immunity to resist infection by *feeding* for at any rate several weeks, we decided to utilise this method.

Accordingly, between Sept. 28th and Dec. 12th, 1931, the nine vaccinated goats still remaining from our first experiments together with 12 kids born of infected dams at the Lazzaretto, and therefore naturally immune, and four healthy normal animals to serve as controls were fed on milk which had been heavily infected by the addition of large numbers of *Br. melitensis* from agar tube cultures. After the lapse of 38 days the blood-serum from each of the four control animals gave a strongly positive agglutination reaction against *Br. melitensis* in dilutions up to 1/110, 1/320, 1/80, and 1/160 respectively. These four animals were killed, and at the post-mortem examination on Feb. 2nd abundant colonies of *Br. melitensis* were obtained from all their organs. On the other hand, all the vaccinated goats and the kids were apparently unaffected, and their serum reactions remained completely negative.

### RESULTS AND CONCLUSIONS

The result of these three experiments may be set out in tabular form thus:—

| Expt. | Method of infection. | Controls. | | Vaccinated. | |
|---|---|---|---|---|---|
| | | Exp. | Inf. | Exp. | Inf. |
| 1 | Natural contact .. .. | 9 | 1 | 11 | 0 |
| 2 | Subcutaneous inoculation.. | 2 | 2 | 2 | 1 |
| 3 | Infected food (milk) .. | 4 | 4 | 9<br>12 kids | 0<br>0 |
| — | — | 15 | 7 | 34 | 1 |

Exp. = exposed; Inf. = infected.

N.B.—In the second experiment the infection of the vaccinated goat was very mild and might very easily have been transient only—since no micro-organisms were found on post-mortem examination.

We believe that these results show that our method of vaccination is sufficient to protect goats against the mild infection, which is the rule in goats under natural conditions; and we are confident that if the goats of these islands are treated as suggested (intradermal inoculation of the Zammitt-Debono vaccine) the spread of undulant fever can be effectively stopped.

Twenty-one animals, comprising 9 vaccinated goats and 12 kids born of infected mothers (which latter we believe to be naturally immune), now remain at the Lazzaretto.

Our recommendation is that these animals should

[2] Reports Med. Fever Commission, 1907, vol. vi., p. 41.
[3] Jour. Roy. Army Med. Corps, 1908, x., 219.

be distributed amongst herds in the country where they would be subjected to all the natural risks of infection, and kept under close observation for a period of, say, 12 months. If, at the end of that time they still retain their immunity, the value of our method of immunisation will have been conclusively established. The value of the experiment would be enhanced if an equal number of uninfected healthy goats were mixed with the same herds to act as controls.

Our best thanks are due to Dr. A. Critien, superintendent of the public health department, for having kindly placed at our disposal the P.H.D. laboratory, members of his staff, and the spare-rooms at the Lazzaretto. We have also to thank Dr. Huddleson for providing us with the special strain of *Br. abortus*, and to Surg. Lieut.-Commander Rainsford, R.N., for help during the investigation.

## LYMPHADENOMA WITH RELAPSING PYREXIA

### A CASE ASSOCIATED WITH ERYTHRÆMIA

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Mrs. A., aged 65, was first seen by me on Oct. 19th, 1927. She gave a history of first having had enlarged glands 12 months previously, when surgical removal had been advised and declined. Throughout 1927 she had been subject to attacks of fever, which occupied from three to five days in every fortnight, the maximum temperature being usually 102° or 103° F. (Fig. 1). The febrile period was always accompanied by breathlessness and heavy sweating, and left her feeling weak, but in the intervals she regained strength and felt well until the next attack. She stated that, apart from the febrile periods, she had felt much better since a course of treatment by arsenic and X rays, and had required no medical advice or treatment for several months.

When seen, she was a well-nourished, rather pale woman with enlarged glands in the left axilla and in the left abdomen. There was no enlargement of the liver or spleen, and no clinical evidence of enlargement of the mediastinal glands. No subcutaneous nodules or hæmorrhages were present, and there was no history of hæmorrhages, except conjunctival. Her temperature was 102°, but next day it was normal and on the 21st subnormal, when she felt well and got up in her room. On the 22nd she had a relapse and the temperature touched 102° again. This, however, was exceptional, her febrile attacks from that time onwards until the terminal stage of her illness being spaced as she had described them; fortunately she had preserved her earlier temperature charts (Fig. 1). On Oct. 29th, when she was feeling well, her blood was examined by Dr. H. M. Galt, who reported:—

| | | | |
|---|---|---|---|
| Red cells .. .. | 7,410,000 | Polymorphs .. .. | 31% |
| White cells .. | 13,100 | Lymphocytes .. | 67% |
| Hæmoglobin .. | 112% | Eosinophils .. .. | 2% |
| Colour-index .. | 0·8 | | |

In the stained films the red cells were normal in shape, size, and staining reactions.

This was an unexpected result, which was corroborated by a further count taken on Nov. 5th when she was in her next febrile attack.

She was placed under the care of Dr. W. Barrington Prowse for actinotherapy and was given arsenic by mouth and by injection in the form of sodium cacodylate, and various symptomatic remedies were employed in the hope of preventing the febrile attacks. None of them had the slightest effect, and the intermittent attacks of fever continued up to the terminal continuous pyrexia.

In December she saw Sir Thomas Horder, who wrote to me on the 16th saying that he agreed with the diagnosis of lymphadenoma.

During the ensuing weeks the external glands diminished steadily, until by Jan. 10th those in the axilla had disappeared, and on Feb. 2nd, when I had an opportunity of examining her in bed, the abdominal mass was no longer palpable. On March 24th I saw her after an interval of a month, when she told me that her last two attacks of fever had been more severe than usual, and had been accompanied by intense drowsiness. She was on that date up and about, and looking comparatively well.

On April 24th I saw her again, and for the first time felt the spleen. The liver was not enlarged; there were still no external glands to be felt, and the air entry was free and equal over the whole area of both lungs. She was persuaded to start a second course of sodium cacodylate injections. Her febrile attacks were now definitely more severe, so much so that on occasions she sent for me at the time, and I have notes of 103·6° F. on April 27th, 104° on May 21st, and 104° on June 6th, when the spleen had enlarged further, and glands were palpable for the first time in the right axilla. During the whole of this time she was up and about, leading a more or less ordinary life, refusing to give in to her malady, and even during the febrile periods by no means always staying in bed, having from long previous residence in India got into the way of disregarding what she considered (and there was no object in disillusionising her) as no more than the "fever" to which she had been accustomed in the past. It appeared now that fever in some degree was becoming constant (Fig. 2).

Dr. A. Salusbury MacNalty's report for the Ministry of Health on "Investigation of Lymphadenoma with Relapsing Pyrexia," strongly appealed to her when she was told that she was the subject of a rare type of a rare disease of sufficient importance to have been made the subject of a government research, and for the first time I was able to keep her under something approaching continuous observation. The spleen steadily increased in size, but not the external glands, although she had had no exposure to X rays since March 23rd. There was deep resistance in the abdomen in the middle line over the vertebral column, and she was troubled by bronchial catarrh, which appeared to indicate intrathoracic pressure, although clinically I could make out no dullness, and air entry was equal. She began to lose weight and strength, but on June 19th she drove up to the County Hospital and had a fifth and last blood count from Dr. Galt. This showed the same blood picture, although she was then in the terminal stage of her disease. Pyrexia was now practically continuous, and enlargement of the spleen was constant. It was, however, not until July 1st that she first complained of pain in the region of the spleen. On July 16th anasarca of the lower limbs developed. She then went rapidly downhill and died on July 21st, 1928, at the age of 66 years and 1 month.

The oldest patient with this disease in cases previously on record is said by McNalty to be a woman aged 54 years, and in his monograph[1] I find no blood counts at all comparable with those of this patient, although he has collected all cases published in the literature up to 1928. Details of the

| Date. | Hg. | Red cells. | White cells. | C.I. | Differential count. | | |
|---|---|---|---|---|---|---|---|
| | | | | | Polymorphs. | Lymphocytes. | *E.M.T. |
| | % | | | | % | % | % |
| 31/10/27 | 112 | 7,410,000 | 13,100 | 0·8 | 31 | 67 | (*a*) 2 |
| 5/11/27 | 108 | 6,690,000 | 14,800 | 0·8 | 54 | 46 | — |
| 12/12/27 | 100 | 6,360,000 | 10,200 | 0·8 | 67 | 30 | (*b*) 2<br>(*c*) 1 |
| 27/3/28 | 94 | 5,060,000 | 5,500 | 0·9 | 56 | 43 | (*a*) 1 |
| 19/6/28 | 102 | 7,300,000 | 9,300 | 0·7 | 69 | 30 | (*a*) 1 |

*E.M.T. = (*a*) Eosinophils. (*b*) Large mononuclears. (*c*) Transitionals.

In all five examinations the red cells were reported normal in shape, size and staining reactions.

[1] Ministry of Health Reports on Public Health and Med. Subjects, No. 50. London, 1928.

five blood counts by Dr. Galt are given in the accompanying Table.

### POST-MORTEM EXAMINATION

A post-mortem was made at the Royal Sussex County Hospital on July 22nd by the late Dr. J. W. Cropper.

The body was that of an elderly woman and, though poorly nourished, was by no means emaciated. There was no unusual pallor of the skin, and the colour of the internal organs, mucous membranes and body fat gave no indication of anæmia. The finger-nails, lips and ears were moderately cyanosed. No enlarged glands were visible or palpable in the neck, axillæ or groins. The *heart* showed moderate dilatation of both ventricular cavities, but no hypertrophy. There was a liberal deposit of fat over the anterior surface, the heart-muscle was flabby, and beneath the endocardium and on the cut surface of the myocardium there were distinct striæ of fatty deposit. Microscopical examination showed fatty infiltration, with cloudy swelling and fragmentation of the muscle-fibres. The valves of the heart, the aorta and the coronary arteries were healthy. The blood had the normal deep red post-mortem colour, and was clotted to a normal degree, the coagula being, however, rather soft. There were no signs of capillary hæmorrhages in any of the organs or mucous membranes.

The *liver* was enlarged, fatty and congested, with an advanced "nutmeg" appearance. The spleen was large and very soft. Except for congestion of the bases the *lungs* were healthy, as were also the *kidneys*, *adrenals* and *pancreas* and the whole of the *alimentary tract*. A careful search for hyperplasia of Peyer's patches and the solitary follicles was quite negative. There were a few small subserous fibroids and a pedunculated polyp of the body of the *uterus*, but otherwise the pelvic organs were normal. The weights of the chief organs were as follows: heart 11 oz., right lung 15 oz., left lung 16½ oz., liver 72 oz., spleen 32 oz., right kidney 6 oz., left kidney 4½ oz. The brain and spinal cord were not examined.

*Lymphatic glands.*—The axillary, bronchial and retro-peritoneal glands were enlarged, but the cervical and inguinal glands were not affected. In the right axilla there were three small glands and one larger one about the size of a walnut. In the left axilla there were eight enlarged glands, each about the size of a small bean. All the axillary glands appeared to be in a more or less early stage of the disease, and were buried deep against the thoracic wall. The enlarged glands in the thorax were practically confined to the root of the left lung, around and below the left bronchus, and had a total weight of 6 oz. The largest mass of glands was in the abdomen, extending from the pancreas to the bifurcation of the aorta, and weighing 13 oz. No pressure effects from any of these masses were discernible.

The macroscopic appearance of the glands conformed in the main to the description of Hodgkin's disease. They were all discrete, with thickened capsules, and without any sign of periglandular infiltration. There was not the slightest suggestion of caseation or suppuration. The masses of glands were held together by inflammatory adhesions in the surrounding connective tissue. The smaller glands were of a uniform dull pink colour, and were notably elastic in consistency. The largest of the glands had a variable texture in different parts, elastic pink portions being admixed with soft hæmorrhagic areas and firm white patches. A few of the smaller glands were of a dead white colour and firm consistency. In none of the glands were there any of the greyish translucent areas, or yellowish patches, commonly described.

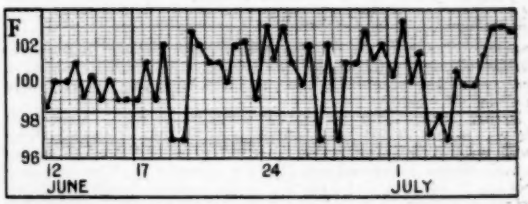
Sections of two of the glands were made and their histological characters confirmed the diagnosis of Hodgkin's disease. One of the pink glands showed the typical replacement of the lymphoid tissue by hyperplasia of the reticulum, many of the cells of which were of the usual "lymphadenoma" type. The section of one of the firm white glands showed simply a mass of hyaline fibrous tissue containing but few cells.

The *spleen* was much enlarged but maintained its normal shape. The capsule was only slightly thickened and, as peritoneal adhesions were entirely absent, the organ was easily removed. It was very soft, indeed friable. The colour of the cut surface was a mottled mixture of irregular white areas, varying in size from a pin's head to a pea, with the intervening deep red congested splenic pulp. On microscopic examination the white areas showed an excessive proliferation of endothelial cells, arranged in alveoli separated by a fibrous reticulum, no spleen tissue proper being visible.

The *bone-marrow*, taken from the middle of the shaft of the femur, was of a chocolate colour, similar to that found in other conditions in which the erythroblastic functions of the tissue have been subject to prolonged stimulation. Smears of the marrow, stained by Knyvett Gordon's method, showed abundant normal red blood-cells and a fair number of normoblasts, but no megaloblasts. There were large masses of lymphocytes, but neutrophil leucocytes were comparatively scanty, and only an occasional eosinophil and basophil were present.

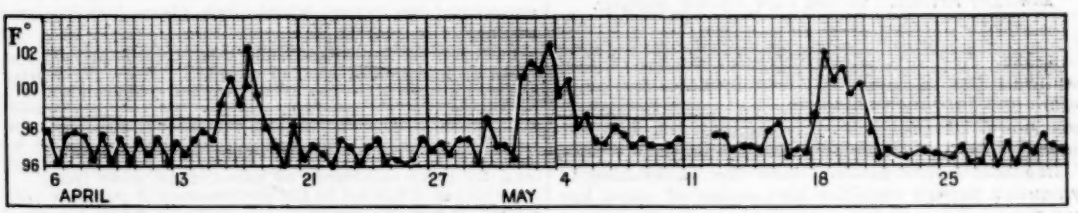
The outstanding features of the post-mortem examination in this case were the absence of anæmia and emaciation, the absence of visible or palpable subcutaneous lymphatic glands, the marked enlargement and soft character of the spleen, and the response of the bone-marrow.

FIG. 2




Temperature chart in June and July, 1928. Terminal type of fever.

FIG. 1




Temperature chart during April and May, 1927, showing occasional bouts of fever.

### HISTOLOGICAL REPORT

The tissues preserved by Dr. Cropper were sent to Prof. M. J. Stewart of Leeds, to whom I am much indebted for the following report:—

1. *Bronchial gland.*—The histological characters of this gland are those of Hodgkin's disease in a moderately early stage. The normal glandular architecture is entirely lost, the whole section showing a uniform collagenous reticulum with endothelial cells, small "Hodgkin" giant cells and lymphocytes, scattered about in the meshes. The giant cells are fairly numerous and very characteristic, with large lobulated nuclei. No eosinophils are seen, but the staining is poor.

2. *Axillary gland.*—The changes here are in keeping with a much older Hodgkin's lesion of the chronic type. The gland is much and extensively fibrosed, but many endothelial cells are scattered about amongst the collagenous matrix.

Here and there are areas of greater cellularity, where, in addition to accumulated endothelial cells, there are many lymphocytes and a few Hodgkin-type giant cells. Again no eosinophils can be distinguished.

3. *Lumbar gland.*—The appearances here are quite different from both (1) and (2). The lymph-gland tissue is wholly replaced by loose cellular tissue of endothelial type, held together by a scanty collagenous reticulum. Some of the cells are of Hodgkin giant-cell appearance. The only lymphocytes seen are a few in certain narrow ill-defined fibrous septa which run through the growth. There is no dense fibrosis as in (2), but there are scattered fairly extensive patches of recent necrosis.

*Spleen.*—The structure is much altered, the organ showing areas which are strongly suggestive of Hodgkin's granuloma.

The *kidney* shows much post-mortem change, but nothing to suggest Hodgkin infiltration.

*Liver.*—There is no definite evidence of infiltration by Hodgkin's granuloma, although one small focus is suspicious. There is some patchy lymphocytic infiltration of portal tracts. The hepatic lobules are in part rather degenerate (fatty change plus early cytolysis). The most obtrusive feature of the section is the presence of many hyperplastic nodules of various sizes.

*Heart wall.*—The narrower section (? right ventricle) shows notable adipose infiltration of the muscle. The wear and tear pigment at the poles of the nuclei in the muscle-fibres is abundant (brown atrophy). The broader section (? left ventricle) shows, as its most obtrusive feature, extreme engorgement of the delicate, thin-walled capillaries of the outer half of the myocardium and adjacent sub-epicardial fat. The latter infiltrates the muscle slightly. "Brown atrophy" is even more marked than in the first section.

*Smears of bone-marrow and spleen* show nothing of note.

Prof. Stewart's conclusion is as follows: "I think the glandular and splenic changes are in keeping with Hodgkin's disease. The bronchial gland is typical of the active and moderately early stage, the axillary of the chronic fibrous stage. The lumbar gland is atypical, but still in keeping with the diagnosis. The absence of eosinophilia does not seriously discount this opinion."

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# SPONTANEOUS SUBARACHNOID HÆMORRHAGE

## FROM CONGENITAL INTRACRANIAL ANEURYSM

BY MAURICE E. SHAW, M.D. OXF., M.R.C.P. LOND.

ASSISTANT PHYSICIAN TO THE WEST LONDON HOSPITAL

IN 1923 Symonds [1] drew attention to the clinical manifestations of congenital intracranial aneurysms. Before this date such aneurysms had not infrequently been noted at post-mortem examinations, but the clinical picture was not sufficiently definite to permit of diagnosis before death. Since the publication of Symonds's paper a considerable number of cases has been recorded in which a clinical diagnosis of congenital aneurysm has been made with a reasonable degree of certainty, in spite of the fact that in a number of these cases the diagnosis has not been verified at autopsy, the patients having survived. I reported such a case myself in 1927.[2]

A spontaneous hæmorrhage into the subarachnoid space is now a well-recognised condition which is easy to diagnose with the aid of lumbar puncture. Often the diagnosis may be made with considerable confidence without examination of the cerebro-spinal fluid. In young patients who show no evidence of any other disease such hæmorrhages are usually due to the presence of an aneurysm of one of the arteries at the base of the brain. If the aneurysm is so situated that it will give rise to precise localising symptoms, its position can be predicted with as great certainty as its presence. The following case illustrates the main points in the diagnosis of subarachnoid hæmorrhage; it also illustrates some of the signs and symptoms caused by an aneurysm at the base of the brain.

[1] Symonds, C. P.: Guy's Hosp. Rep., 1923, lxxiii., 139.
[2] Shaw, M. E.: Ibid., 1927, lxxvii., 242.

### CASE RECORD

A married woman, aged 50, was seen at midday on April 16th, 1932, in consultation with Dr. P. C. Bhandari, at Brentford. She had been travelling home from a holiday the previous evening by road. At about 5 P.M. she stopped her husband, who was driving, and told him that she did not feel well. He helped her to get out, and she rapidly became unconscious.

She was brought home by ambulance and regained consciousness during the night, but complained of severe headache which was unrelieved by the ordinary remedies. When I saw her the next day she was tossing about in bed, unable to get any relief from the pain, which was most severe in the frontal and occipital regions.

Ptosis of the left eyelid was at once obvious. On more detailed examination complete paralysis of the left third cranial nerve was found, but no other lesion of the central nervous system could be detected. All the reflexes were perfectly normal; sensory and motor functions were unimpaired, and the optic discs showed no changes. There was very slight rigidity of the neck, but Kernig's sign was negative. The heart was normal, and the blood pressure 153/85. Nothing unusual was found in the chest or abdomen.

I felt certain that a subarachnoid hæmorrhage was the cause of the loss of consciousness. The oculomotor palsy suggested that the site of the hæmorrhage was in close relation to the circle of Willis, and the possibility of an aneurysm in this position had to be considered. There was no evidence of arterio-sclerosis or other disease, such as ulcerative endocarditis, which could have caused an aneurysm. On the other hand, I thought that a congenital aneurysm would have been likely to show itself before the age of 50. Her previous history was quite negative when I first inquired about it, but on asking the husband whether he could remember any sort of attack similar to the present one he recalled that, during his absence at the war, he had been told of his wife having a "stroke" from which she had made a perfect recovery. This history completed the clinical picture, and left practically no doubt that we were dealing with a congenital aneurysm which had given rise to two attacks of hæmorrhage.

I advised her immediate removal to hospital, and she was given an injection of gr. ¼ of morphia. A few hours later she was admitted to the West London Hospital, where I performed lumbar puncture, and drew off a typical blood-stained fluid. The wisdom of performing lumbar puncture may be questioned; theoretically, it seems to me to be irrational as, by lowering the intracranial pressure, it must tend to make recurrence of hæmorrhage more likely. I confess that I was led to the performance of puncture very largely by a desire to confirm the diagnosis, which could not then be questioned in the event of recovery. Only sufficient fluid was removed to prove the presence of hæmorrhage, and morphia was given for relief of the headache and to control the restlessness.

The pulse-rate, which had been 60 before the puncture, rose to 84 afterwards. On the next day it was 44, and the temperature had risen from 99·2° to 100° F. A further lumbar puncture was performed by a well-meaning house physician without my authority, but, in view of the slow pulse, it was possibly justified. The condition certainly improved, and the temperature became normal the next day.

The improvement continued until April 25th, when the patient suddenly became unconscious and died in a few hours. Clearly another and larger hæmorrhage had taken place. During the whole time the patient was in hospital the cranial nerve palsy persisted unchanged, and no further evidence of involvement of the central nervous system made itself apparent.

A *post-mortem examination* was made by Dr. R. Elworthy. A small ruptured aneurysm was found on the left anterior

choroidal artery close to its origin from the internal carotid. The under-surface of the temporal lobe was covered with extravasated blood, and a considerable quantity of blood had found its way into the lateral ventricle. This was probably the result of the terminal large hæmorrhage, the blood following the course of the artery into the ventricle. The position of the aneurysm is indicated in the illustration, which is semi-diagrammatic.

DISCUSSION

Cases similar to the one here described are probably fairly common but, although the condition is thoroughly familiar to neurologists, it has not yet attained the wide recognition that its frequency merits. I find that house physicians and post-graduate students regard such cases as rare, and think that their diagnosis can only be made by a skilled

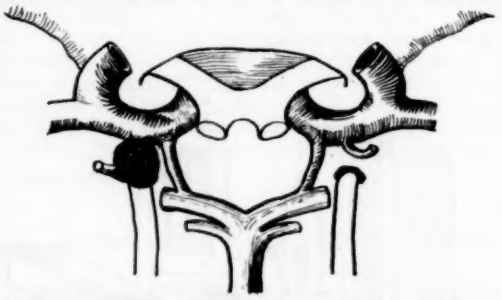


Diagram showing position of aneurysm (black) at junction of internal carotid and anterior choroidal arteries and its relationship to the left oculomotor nerve.

neurologist. I believe that in most cases of subarachnoid hæmorrhage from congenital aneurysms, the diagnosis is no more difficult than that of lobar pneumonia. The first essential is to keep the possibility in mind when called to see a case of sudden loss of consciousness—especially in young patients. Subarachnoid hæmorrhage may be due to other causes, especially in older patients, but the history of its onset will always be similar. Where the hæmorrhage is not due to an aneurysm the localising signs may be absent.

In all cases of subarachnoid hæmorrhage the onset is sudden. Loss of consciousness is the rule, and lasts for a variable period. Progressive recovery, at any rate temporarily, is usual. Localising signs may or may not be found, depending upon the source and location of the hæmorrhage. They vary from complete cranial nerve palsies, as in the case here described, to indefinite hemiparesis merely indicating diffuse pressure on one or other motor tract. As with any hæmorrhage into a serous cavity, there is usually a rise of temperature. The presence of the blood in the subarachnoid space causes irritation of nerve-roots, and so gives rise to varying degrees of neck rigidity, and even, sometimes, to a positive Kernig's sign. When all these features are marked, the clinical picture is very similar to that of meningitis, and there can be no doubt that in the past most of the cases were diagnosed as meningitis; where blood was found in the cerebro-spinal fluid this was attributed to carelessness in the performance of the lumbar puncture.

In point of fact, accidental hæmorrhage during puncture is very uncommon. It can only occur if the needle is pushed too far and so strikes the venous plexus on the anterior wall of the vertebral canal. Anyone with experience of lumbar puncture would know that this had happened. If any doubt exists, it can be dispelled by collecting the fluid in several successive tubes. If the hæmorrhage is spontaneous all the tubes will contain an equal admixture of blood, if it is accidental, the tubes will contain progressively less and less blood. If the hæmorrhage has taken place more than 24 hours before the puncture is performed, hæmolysis will have begun and the fluid, separated from the blood corpuscles either by centrifuging or by simply letting it stand, will have a distinctly yellow tinge. The yellow colour can be proved, by the use of the spectroscope, to be due to hæmoglobin or its derivatives. These facts are well known, but I still meet with house physicians who blame themselves for a clumsy puncture (and discard the fluid, the only evidence of their innocence!) in cases of undoubted spontaneous hæmorrhage. This mistake should not be made if the possibility of a pre-existing hæmorrhage is in mind.

The clinical features are usually sufficiently distinct to differentiate spontaneous hæmorrhage from meningitis. Reference has already been made to the signs of meningeal irritation which may be caused by the presence of blood in the subarachnoid space. The pyrexia associated with subarachnoid hæmorrhage is, however, less than is found in a case of meningitis of sufficient severity to start with the dramatic suddenness of a hæmorrhage. A sudden onset is not infrequent in cerebro-spinal meningitis, but such cases are usually accompanied by high temperature and get progressively worse during the first few days of the illness. In subarachnoid hæmorrhage the temperature is low and irregular, and the symptoms become less severe unless a further hæmorrhage takes place. Meningitis will not usually give rise to the localising signs which may be found when a hæmorrhage arises from an aneurysm. A history of a previous attack is, perhaps, the strongest evidence that can be obtained in favour of hæmorrhage and against meningitis. Congenital aneurysms quite commonly give rise to one or more attacks of hæmorrhage before one of these proves fatal.

The treatment is that of hæmorrhage in general. The only question which arises is the advisability of lumbar puncture. As a diagnostic procedure this may be necessary. As a therapeutic measure it is probably better avoided, except for the relief of a dangerously high intracranial pressure. In the latter case only sufficient fluid should be removed to restore the pressure to normal, the manometer being used. The presence of papillœdema is a definite indication for the relief of pressure but, in the absence of this sign, lumbar puncture is not desirable.

## THE HYPODERMIC INJECTION OUTFIT IN PRIVATE PRACTICE

By W. E. Waller, M.D. Oxf., M.R.C.P. Lond.

The hypodermic injection outfit is perhaps the most abused portion of the physician's or surgeon's armamentarium—a statement which possibly applies with equal force to hospitals.

The great increase in late years of hypodermic, intramuscular, and intravenous therapy lends to the practical side of the subject a fresh interest. The increasing production by surgical instrument firms of a sequence of patterns of spirit-proof cases for the outfits and of ampoule syringes for emergency use indicate attempts to tackle some of the technical difficulties. Finally, broken hypodermic needles are not unknown, and gain prominence in the lay press.

For many years I have employed the following system in the organisation of injection apparatus,

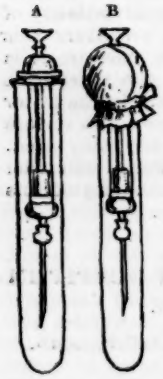
whether for hypodermic, intramuscular, or intravenous use, or for diagnostic venepuncture. The apparatus required is kept mobilised for use on a special small table, but the essential parts can, with ease and despatch, be taken on the round. Apart from the syringes and needles, the cost of the outfit is almost negligible, because it is for the most part adapted from material ready to hand.

*Storage of syringes.*—The following remarks apply especially to Record syringes or those of similar type. The syringe, carrying a stainless steel needle of fairly wide bore, for filling purposes only, and cleaned as stated below, is housed in a test-tube of such calibre that the barrel of the syringe can easily be inserted but the upper metal shoulder cannot (Fig. 1, A). A collar of sterile cotton-wool, completely covered by a similar collar of white lint, is fitted round the protruding part of the piston shaft below its top disc, and secured round the upper part of the test-tube below its lip, by means of a twist of bandage (Fig. 1, B.) The syringe is thus kept quite secure and dry and, suitably protected, can be safely transported in the bag and by car over rough country roads. In the surgery several syringes thus housed can be stored in a large glass sponge jar with a loose cover. This costs about five shillings. A 4 lb. jam-jar would serve equally well.

*Storage and sterilisation of needles.*—In a previous communication [1] I pointed out the advantages of storage and sterilisation in olive oil. Briefly the advantages are: (1) assured sterility; (2) no rusting or blocking; (3) injection made easy and as nearly as possible painless; (4) risk of break minimised from absence of rust; (5) needles do not appear to lose sharpness or temper.

The practical application is as follows. A stove is conveniently constructed from a ¼ lb. Colman's mustard tin, from the front, back, and lid of which appropriate apertures are cut (Fig. 2, A and B). The aperture in front must be of such size that the introduction of the ordinary pattern of Meta fuel lamp, with its metal foot-piece detached, is possible. The steriliser itself consists of the empty plated case of a 10 minim Record syringe. This is large enough to take all sizes of needles likely to be used (Fig. 2, C). This steriliser, without its lid, is half filled with olive oil, placed on the top of the stove, and heated by the Meta lamp until boiling just starts, at which point the lamp is removed by an old pair of Spencer-Wells forceps kept for the purpose. The whole of this part of the outfit is housed in a glass dish, convenient inside measurements of which are 4½ in. long, 3½ in. broad, and 1½ in. deep. This dish is necessary when transport of the set is desired, and also from the point of view of cleanliness, since the stove and other items tend to become oily. In the surgery it is convenient to stand the dish and its contents on a plain glazed tile, 6 in. square, in no way different from the kind used in the walls of bathrooms. This is obtainable at any general store for a few pence. The stove requires cleaning with Vim from time to time, and the oil should be changed when its colour deepens.

FIG. 1

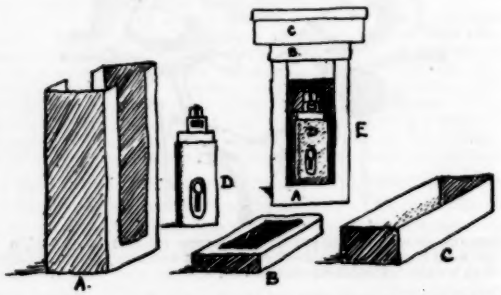



Record syringes housed in test-tubes.

*Preparation of injection.*—A second tile affords an excellent surface and carries small bottles of distilled water, surgical spirit, ether, iodine, small swabs, Meta fuel, and a small pot for expended ampoules, syringe washings, and other waste. Two other items are available—namely, (1) the inside fitting of the Record syringe case, which affords an excellent stand for the syringe (Fig. 4 simplified); (2) the metal bottom piece of the Meta lamp, which can be used as a support for ampoules (Fig. 3 simplified). A plated egg-spoon of plain pattern is added for use in dissolving injections in tablet form, and for sealing the punctures made in the rubber caps of vaccine bottles.

The syringe is withdrawn from its test-tube, and spirit drawn into it. It is then left for two minutes, supported on its stand, while the needles are sterilised and the injection made ready. The spirit is then expelled, the syringe rinsed out with more spirit, then with ether, and the piston worked till the inner surface is dry. By this time the oil will probably be boiling. The lamp is therefore removed and the filling needle sterilised by flaming, the solution being then drawn into the syringe. The filling needle is now replaced by an oil-boiled needle by means of the forceps, the blades of which are sterilised by flaming. It is advisable, when using oil-boiled needles, to leave an air bubble in the syringe, the expulsion of which will drive out oil remaining in the needle. If this is not done, blocking of the needle may occur from the cooling of the oil if the weather is very cold and if some time elapses before the injection is administered. If these procedures are carried out systematically, no oil will gain access to the interior of the syringe. The great convenience of the tiles will also become manifest.

FIG. 2




Improvised steriliser and stove. A, improvised stove with lid removed. B, lid of stove. C, steriliser without lid. D, Meta fuel lamp without its stand. E, stove, steriliser, and lamp assembled. (Scale of front objects approximately 2/5.)

After use the syringe is cleaned out by fixing the filling needle and washing out with distilled water, spirit, and ether until dry, when it is replaced in its tube. Some spirit and ether is expelled through the injecting needle, which is then dropped back in the steriliser.

*Use on the daily round.*—Two methods can be adopted. (1) The injection can be prepared at home, and the syringe taken to the patient secured in its test-tube. This method should not be used with serum, since there is a risk of the piston becoming glued up. (2) The stove can be stored flat in its glass dish, the Meta lamp and steriliser with its lid can be fitted inside it, and the spoon and forceps can occupy the spare space. This travels safely in the bag if kept from upsetting, though some sort of cover for the dish would be an advantage. The syringe and

[1] THE LANCET, 1930, i., 1210.

bottles are taken separately and appropriately protected. One of the patterns of medical bag fitted with drawers and racks for bottles is ideal for this purpose.

FIG. 3

FIG. 3.—Stands of Meta lamp (simplified). In the right-hand one an ampoule is shown in situ.

FIG. 4

FIG. 4.—Inside fitting of Record syringe case (simplified).

*Modifications.*— The system described above meets most requirements, but modifications will suggest themselves, some of which are: (1) after use with a serum the syringe must be dismantled and washed thoroughly in running water; (2) care should be taken to expel all oil from the needle when sclerosing injections are being given; (3) oil-sterilised needles should not be used in taking blood for agglutination reactions, but can be used for blood culture work.

Rustington, Sussex.

# Clinical and Laboratory Notes

## CLINICAL FEATURES OF FORTY-SEVEN CASES OF INFLUENZA

BY H. L. MARRIOTT, M.D., M.R.C.P. LOND.

RESIDENT MEDICAL OFFICER, MIDDLESEX HOSPITAL, LONDON

THE following note concerns 47 cases of influenza among the staff of the Middlesex Hospital between Dec. 20th, 1932, and Jan. 10th, 1933. This, I believe, is a lower proportional incidence than has occurred in many London hospitals. The patients consisted of 36 sisters and nurses, 5 massage students, 4 maids, and 2 house officers.

The cases were of two distinct types characterised by symptoms affecting the alimentary and respiratory systems respectively. There were 7 cases of the alimentary type and 40 of the respiratory type. Within each group the manifestations were remarkably constant from patient to patient.

*Alimentary type.*—The symptoms were epigastric pain, nausea, vomiting, and diarrhœa. The physical signs in every case were slight to moderate tenderness in the epigastrium and slight but definite tenderness in the right iliac fossa.

*Respiratory type.*—The main symptom was troublesome dry cough and a sensation of tightness over the sternum; in 5 cases there was definite pain in the sternal region. As well as the cough, the patients complained of stuffy noses and slight soreness of the throat. In a few cases the fauces appeared generally red and inflamed, but in the majority the throat seemed normal. In not 1 case of the 40 were physical signs detectable in the chest.

In both types the onset was fairly sudden, and in all cases there was general malaise and aching of the limbs. The temperature ranged from 99° to 104° F.; temperatures of 102° and over were recorded in 1 of the 7 alimentary cases and in 22 of the 40 respiratory cases. The pulse-rate varied from 80 to 140. The febrile phase lasted from one to three days in the alimentary cases, and from two to nine days in the respiratory cases. In both types recovery of well-being was rapid as soon as the temperature became normal. The incubation period for either type appears to be from one to three days.

Perhaps the most remarkable feature of the epidemic was the similarity of the symptoms, signs, and course of the cases within each of the two groups; they were "like peas in a pod." No case appeared to combine the features of the two types. I have also observed the same clear-cut varieties in several score of out-patients and in-patients of the hospital. Among out-patients affected by the respiratory type of infection many had signs of bronchitis or bronchopneumonia, in contradistinction to the 40 cases domiciled in the hospital. This appeared to be due to the patients keeping about when febrile. The alimentary type of infection may easily be mistaken for an acute surgical abdominal condition, and the definite tenderness in the right iliac fossa naturally suggests the possibility of acute appendicitis.

The bacteriological aspect of these cases is being investigated by Prof. James McIntosh and Dr. L. E. H. Whitby, of the Bland-Sutton Institute of Pathology. Their investigations are not complete, but it may be stated that Pfeiffer's bacillus has been notably absent from the specimens examined.

## SINGLE-HANDED METHOD OF REDUCING FRACTURES OF THE TIBIA AND FIBULA

BY PHILIP GLYNN, F.R.C.S. ENG.

RESIDENT ORTHOPÆDIC OFFICER AT LEEDS GENERAL INFIRMARY

HAVING read Watson Jones's recent paper[1] on his traction apparatus for reduction and plaster of fractures of the tibia and fibula, I wondered if there was any way of avoiding the use of the pin through the os calcis as the method of traction, at the same time employing the principle and making unnecessary the presence of a skilled assistant either to hold the limb or to plaster. The following method has therefore been devised.

The patient is anæsthetised on an ordinary operating table or trolley, the height of which it is possible to adjust. When fully anæsthetised he is pulled down the table until his legs are flexed at the knee over the edge and a sandbag is placed under the thigh as high as possible to allow the knee to hang clear of the table. The operator sits on a low stool opposite the patient's legs and the table is lowered until the ankles are at a level with his knees. The operator then grips with his knees the patient's ankle and the end of the table is raised until he feels the limit of his grip has been reached, the fragments are manipulated into position and a tight-fitting plaster is applied from the tibial condyles to the malleoli and allowed to set. The fracture is now held against anything except gross movement of the damp plaster, and the foot and thigh are plastered at leisure.

The key to the business is first the grip of the knees; and it is found in practice that the femoral condyles fit remarkably snugly into the hollow below and behind the malleoli, and the hold is quite sufficient to draw out any overlap and to hold the extension, provided that the patient is sufficiently relaxed. For those who have weak adductors it is recommended that they be supplemented by a strap round the

[1] Jour. Bone and Joint Surg., 1932, xiv., 591.

thighs. Secondly, the plaster must be tight-fitting, especially at the prominences of the tibial condyles and malleoli. Where an adjustable table is not available the same principle, with of course not quite the fine adjustment, could be obtained by placing books under the legs of an ordinary table.

While I do not claim for this method the 100 per cent. results of the Watson Jones traction apparatus, it is a definite advance on the older method in which one person holds the limb and another plasters—a difficult proceeding even where both are skilled. The results are infinitely better. It is so simple and effective that it must have occurred to and been used by many other people; to them I offer an apology.

# MEDICAL SOCIETIES

## EDINBURGH OBSTETRICAL SOCIETY

AT a meeting of this society on Dec. 14th with Dr. JAMES YOUNG, the President, in the chair, a communication on the

### Diagnosis of Placenta Prævia

was made by Prof. J. M. MUNRO KERR and Dr. W. G. MACKAY (Glasgow). Prof. Munro Kerr referred to the high proportion of maternal deaths due to placenta prævia, and stated that in order to maintain a low maternal death-rate it was of the highest importance that the most suitable method of treatment should be selected for each case. He spoke of the great difficulty not only of diagnosing the variety of placenta prævia but also of distinguishing between placenta prævia and accidental hæmorrhage. Any satisfactory method of differentiation would be of the greatest value.

Dr. Mackay gave a short résumé of previous investigations which had been carried out in order to locate the position of the placenta in the uterus; he came to the conclusion that the only one up to the present which had been at all satisfactory was that of Manees, Miller, and Holly, who had injected strontium iodide into the amniotic sac of pregnant women. The placenta which projected into the cavity produced a defect at the edge of the shadow when the uterus was pictured from the correct angle. Prof. Munro Kerr and Dr. Mackay had tried this method on ten cases, but as the fœtus had died in three cases it was given up and Uroselectan B, which is non-toxic and non-irritant, was substituted for strontium iodide. Twenty cubic centimetres of this substance were found to produce a suitable shadow, and in the ten cases there were no untoward effects either in the fœtus or to the mother, though there was no doubt that the injection had a great tendency to terminate pregnancy. It was necessary to take at least two radiograms, one postero-anterior and the other lateral. Those he showed at the meeting demonstrated the position of the placenta not only in normal cases, but also in cases of placenta prævia. It could be ascertained, he said, exactly how much of the placenta was in the lower uterine segment and covering the os. Sometimes it was also possible with X rays to diagnose the sex of the child, and to decide whether any coils of cord were round the child's neck.

### Radiotherapy in Gynæcology

Dr. J. B. KING described the principal methods of applying radiotherapy in cancer of the cervix. He believed that the problem of the treatment of the primary lesion was solved and that the minor variations of technique now used in different clinics did not matter greatly as long as the cervix received some 4 to 5000 mg. hours suitably filtered. But the treatment of the parametrium and glands had still to be investigated thoroughly in order to improve the mortality-rate, which was even in the best statistics about 51 per cent. in early cases. Dr. King considered that the only line along which this problem could be attacked was by X ray therapy; it was certain, he said, that the highest percentage of cures had been in the clinics where X rays had been used as an adjunct to radium. He mentioned that 400,000 volts would soon be a possible dose—which was almost double the dose now available—and he thought that with this dose the pelvis could be irradiated very completely. The radium bomb might also be of use for this purpose. There was no danger in carrying out radium or X ray treatment immediately after one another in cases of uterine carcinoma, and he thought that the X ray sickness, so called, due to intensive radiation, was a thing of the past.

Dr. King then discussed radiotherapy for carcinoma of the body of the uterus and of the ovary and concluded that though radium might be of use in the former it was not likely to be of any avail in the latter. In the treatment of fibroids radiotherapy had several advantages over operation. He did not believe in the cure of amenorrhœa by so-called stimulation doses of X rays to the ovaries; for he held that no such effect as slow stimulation was caused by radiation. Successes might be attributed to destruction of persistent cystic follicles rather than to stimulation of ovarian secretion.

## HARVEIAN SOCIETY OF LONDON

THE 101st annual general meeting of this society was held on Jan. 12th at 11, Chandos-street, W. The retiring president, Mr. CECIL P. G. WAKELEY, delivered his presidential address on the Rôle of Specialisation. Mr. Wakeley recognised that specialisation in medical practice was inevitable owing to the individual's inability to make himself familiar with the many and varied additions to his science and art, but in this country specialisation was characterised by certain developments which were not beneficial to the community. For example, regional specialisation in the art of surgery was largely artificial; it gave rise to various "'ologies" which were of economic value to their practitioners but of dubious value to the patient. Again, the teaching of medicine and surgery in multiple special departments tended to divorce the student from the general principles. Mr. Wakeley contended that specialisation in hospital practice should be determined by the genius of the individual practitioner and the interests of the patient; it should not be enforced on successful candidates for hospital appointments because it was convenient to hospital administration. For the treatment of the sick he agreed with Vesalius (1543), who described the "distribution among different practitioners of the practical applications of the art" as mischievous.

Mr. Wakeley then inducted the new president, Lieut.-Colonel E. L. Gowlland, into the presidential chair. Dr. Tom Hare and Dr. Macdonald Critchley were appointed hon. secretaries, and Mr. Wakeley hon. treasurer.

CORRIGENDUM.—In THE LANCET of Jan. 14th (p. 84) Prof. Stanley Davidson was wrongly reported as saying that a preparation of solid ferrous chloride on the market costs the patient 4*s.* a day. The sum mentioned was 4*d.*, not 4*s.*

# REVIEWS AND NOTICES OF BOOKS

## Mental Deficiency due to Birth Injuries

By EDGAR A. DOLL, Ph.D., Director of Research, Vineland Training School, New York; WINTHROP M. PHELPS, M.D., Professor of Orthopædic Surgery, Yale University; and RUTH T. MELCHER, M.A., Research Assistant, Vineland Training School. London: Macmillan and Co., Ltd. 1932. Pp. 289. 24s.

VERY varied estimates are current of the proportion of mental defect that is attributable to birth injury. Institutional statistics in the past have often shown very high percentages; the authors of this monograph, who betray a tendency to overstress the importance of birth injury in causation, suggest a percentage of between 5 and 10. Tredgold, although he obtained a history of birth injury in a large number of cases, rejected it as a cause except in about 1 per cent. or 2 per cent., because mostly there was also a definite neuropathic taint. The mental deficiency committee of the British Medical Association recommended critical care in the examination of any claim that birth injury is a cause of mental defect in any specific case; Dr. Doll and his colleagues, on the contrary, seem to suggest a possibility of such causation in cases where no such claim is made. The physical and mental condition of 12 cases specially studied are recorded in this monograph, the ætiology and development and the results of neurological examination and of mental and physical measurements being set out. All these were cases in which birth injury had apparently produced a permanent mental defect along with serious motor handicap, manifested usually as spasticity, athetosis, or incoördination. They cover a wide range of age of both sexes, including all grades of defect up to the borderline.

The authors propound more problems than they solve, and the work lacks positive results. One of the main objects of the investigation was to discover how far it is possible by physical therapy to improve not merely the motor condition of the subjects but also their mental condition. Dr. Doll and his collaborators are their own severest critics when they admit that it was not possible adequately to measure either the mental or physical improvement during a period of treatment which they admit, moreover, was too short. Growth processes coinciding with the treatment interfered with the assessment of results, and while some increase of mental alertness and improvement in social functions were noted, a careful study of the detailed descriptions fails to reveal any improvement of substantial value to the individuals concerned. In the course of the inquiry it was found necessary to attempt to estimate the value of certain types of mental tests in assessing these subjects. The Stanford-Binet scale seemed to be less affected than were other tests by handicaps of speech and motor control, and lack of experience and training. The authors claim to have demonstrated that birth-injured cases tend to show a type of development which continues beyond the usual age of maturity, so that early retardation is offset by the prolongation of later development. So wide an inference, however, can scarcely be based on the study of a few cases. There is much repetition in the book, and, from the reader's point of view, the arrangement by which he has to search through four different sections of the book, including an appendix, to obtain a complete account of any one case is not convenient. It is to be hoped that the investigation, which is being continued, will later be more fruitful of positive results.

## Mechanism of Creative Evolution

By C. C. HURST, Ph.D. Cambridge University Press. 1932. Pp. 365. 21s.

## Recent Advances in Plant Genetics

By F. W. SANSOME, Ph.D., and J. PHILP, B.Sc. London: J. and A. Churchill. 1932. Pp. 414. 15s.

## Recent Advances in Cytology

By C. D. DARLINGTON, D.Sc., Ph.D. London: J. and A. Churchill. 1932. Pp. 559. 18s.

MAN has been moulded by variation and natural selection. He has advanced beyond brute beasts by his capacity to control his environment, and live, to some extent, under conditions which he chooses himself. In this way he has had an influence on natural selection, qualitative and quantitative, and he has so arranged his surroundings that moral and spiritual as well as carnal qualities have their values. But he has taken very little deliberate action to arrange himself, and the practical purport of these three books is to explain that the great advances which have been made in genetics in the last 30 years have put him into the position of being able to add a cubit to his stature if he wants to, and to surround himself with animals and plants which are to his liking. This is the professed argument of Dr. Hurst's book, which is clear, readable, beautifully illustrated, and cheap; it expounds plainly the doctrine (or fact) that the differences between the species and varieties of live organisms depend on differences in the genes in the chromosomes. The other two are more detailed and technical, and are hardly for general reading. Dr. Sansome and Mr. Philp, who work at the John Innes Horticultural Institution, describe the recent work on plants, and have a final general chapter which we could wish was longer. Dr. Darlington, of the same institute, deals with the same topics in a more general way; his book is for the serious student and the title is quite misleading, for there is practically nothing about any cellular constituent except the chromosomes. Those who are interested in mitochondria and the Golgi apparatus may be disappointed.

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## La polypose recto-colique

By Dr. PIERRE AUGIER, Chef de Clinique à la Faculté de Médecine de Paris. Paris: Baillière et fils. 1932. Pp. 282. Fr.40.

THIS monograph provides an exhaustive clinical and microscopical study of polyposis of the colon and rectum. The most important type of the disease is described under the name of essential polyposis, which corresponds to the term polyposis intestini, as generally accepted in this country. Every aspect of the ætiology and symptomatology is considered in detail, and the peculiar association with polyposis of two other conditions is noted—one being clubbing of the fingers without cyanosis or venous dilatation ("hippocratisme digital"), and the other "intestinal infantilism," the significance of which is discussed, and is to be further investigated more fully. In Chapter IX. the relationship between polyposis and cancer is debated; the author reports that in 110 cases which he has analysed, malignant degeneration, verified at operation or post mortem, was proved to have taken place in 37 cases, or 33·6 per cent. Other forms of polyposis, such as that associated with

bilharzia infection and the inflammatory type of polyposis, are also described. Treatment varies with the type of the disease; the indications for electrocoagulation, radiotherapy, and major surgical operations, such as colectomy, are all discussed. Case reports of 121 cases of polyposis are appended.

This monograph clarifies and consolidates our present knowledge of polyposis of the colon.

## An Atlas of Skin Diseases in the Tropics

By E. C. SMITH, B.A., D.P.H., D.T.M. & H. Eng., Pathologist, Medical Laboratory Service, Nigeria. London: John Bale, Sons and Danielsson, Ltd. 1932. Pp. 60. 100 plates. 21*s*.

THE text of this useful atlas is brief; it does not compete with standard works on dermatology. It is primarily intended for the use and reference of tropical practitioners, whose daily work will doubtless bring them into contact with many of the dermatoses herein described and photographically illustrated. As regards illustrations, the book is a real treasure, for none of them appears to be borrowed, and every one is a technical success, the result in part, no doubt, of the pigmented background, against which the lesions stand out like the mountains in a relief map. The photographs and microphotographs demonstrating experimentally produced prickly heat (miliaria papulosa) and with a monilia as the alleged cause will certainly arouse comment. Hitherto a staphylococcus has been generally accepted as a factor, but Dr. Smith has succeeded in producing the typical eruption in from 5 to 12 days by local application of strong broth cultures of the monilia. A further observation of much interest and possible significance relates to the prevalence of melanotic sarcoma, stated to be "by far the most common malignant growth," usually on the foot, among natives. Dr. Smith is doubly qualified to write a book of this kind, for not only has he had clinical experience, but is a trained pathologist, writing most of the time with one eye to the microscope. This pathological approach, together with the admirable illustrations, should ensure the success of his atlas.

## Excitability: A Cardiac Study

By W. BURRIDGE, D.M., M.A. Oxf., Professor of Physiology, Lucknow University. London: Humphrey Milford, Oxford University Press. 1932. Pp. 208. 16*s*.

THIS book is difficult to read and to understand. In it are recorded and correlated the results of a long and carefully carried out series of experiments aiming to elucidate the problems of excitability and contraction in muscle, particularly in heart muscle. Using the isolated heart of the frog, Prof. Burridge has tested its reaction to various reagents, as unusual as 40 per cent. alcohol and 5 per cent. KCl. From his results, which are undoubtedly interesting, he attempts to unravel the mysteries of the function of heart muscle, but only succeeds in making it more difficult to understand. He further obscures the issue by entering the field of metaphysics to obtain support for his contentions, and throughout the work steps lightly from this muddy walk of physiology to the still muddier fields of psychology, a feat likely to have a shattering effect on the reader's intellectual processes. For example, his conception of mind as a sort of frothy by-product of the metabolism of nerve-cells is based on no more solid ground than the argument that as contraction of muscle-fibre is a phenomenon in two phases, so a nerve-cell must be possessed of a material and a metaphysical function. The literary style is as original as the matter, but there is an unfortunate tendency to repetition, and a too frequent use of metaphors.

## Minor Surgery

Second edition. By FREDERICK CHRISTOPHER, S.B., M.D., F.A.C.S., Assistant Professor of Surgery at the Northwestern University Medical School, Chicago. London: W. B. Saunders Co., Ltd. 1932. Pp. 996. 50*s*.

THE new edition of this popular book confirms the high opinion we formed of it when it was first issued. Much new matter has been added to bring it thoroughly up to date. A vast area of knowledge is included in the term minor surgery. The author of a book designed to cover this area can either confine himself to the methods actively practised by himself, or can select from his own and the published experience of others those methods which appear to give the best results. The latter procedure, which has manifold advantages, has been adopted by Prof. Christopher. His descriptions are the more useful since he supplies the sources of information which have guided him in his choice. This is a valuable book, providing a most reliable guide for the house surgeon. Practising surgeons will find within its covers much information that could only be collected by arduous and time-consuming search of surgical literature.

## Lunacy Accounts

By T. C. S. KEELY. London: Jordan and Sons, Ltd., Chancery-lane, W.C. 1932. Pp. 79. 7*s*. 6*d*.

EQUIPPED with long experience in the office of the Masters in Lunacy at the Royal Courts of Justice, Mr. Keely has written a short book on lunacy accounts which will be useful to those who, as trustees or receivers, are responsible for the affairs of a mental patient. If lawyers, they may know the relevant Acts and cases, but may have something to learn about the most acceptable method of presenting accounts and about the department's attitude towards particular items of expenditure. If laymen, the information (and the specimen accounts) will be all the more valuable. Will the Master, for example, sanction allowances from surplus income to the patient's wife and family, poor relations, and old servants? Will he authorise the continuance of the patient's club subscriptions? What may properly be included under "Miscellaneous Expenditure"? Mr. Keely answers these and similar questions. He advises us not to put down a round sum for miscellaneous expenses—not because the department wants to be niggardly, but because a receiver should not charge for such items more than he has actually spent. Nowadays the department, in reviewing the management of a patient's estate, wants more than mere columns of payments and receipts. It may ask about his housing, care, and comfort, his capacity to enjoy outings, amusements, and little luxuries, the desirability of moving him, and whether any special course of training or treatment, surgical operation, or dental attention is required. Mr. Keely assures us that the department welcomes suggestions for the benefit and advantage of a mental patient, and gives effect to any which are found possible and desirable.

# THE LANCET

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## THE PROBLEM OF CONVALESCENCE

ACUTE illness appeals to the imagination both of the patient and of those who have the care of him. It is, as CHARLES LAMB remarked,[1] a magnificent dream for a man to lie a-bed, and draw daylight curtains about him, to become insensible to all the operations of life except the beatings of one feeble pulse, to be a giant of self-importance who swells in the sole contemplation of his single sufferings—epitomised by LAMB in the phrase "the puffy state of sickness." The treatment of acute illness has been developed into a state of great efficiency; outside FORD'S works there is probably nothing much more efficient than the team of an operating theatre with its quiet concentration on essentials of life and death. But, as LAMB remarks, how convalescence shrinks a man back to his pristine stature. Even the visitations of the medical attendant have changed. Can this be he who so lately came between the patient and his cruel enemy, as on some solemn embassy from nature? This man of news, of chat, of anecdote. "Pshaw!" says Elia, "'tis some old woman." And it is a matter of everyday experience that the treatment of the convalescent, being further from the centre of interest, lacks the care and attention which it deserves. We know, for instance, with rather insistent accuracy, the risks of childbirth; but no one can more than guess the extent to which the chronic illness which it leaves in its train cripples the happiness and efficiency of domestic life. The patient is treated adequately in hospital for, let us say, pneumonia or some surgical emergency. He goes out "cured"; and indeed every effort is made to speed the parting guest, for the running cost of hospitals is necessarily high. But his discharge from hospital may be delayed beyond the time when he requires such special attention because of the fear that he is unlikely to regain at home the fitness to resume his daily avocation. He may be left with some respiratory infection, with debility, and some slackness of the abdominal muscles, and because in our present system the means are lacking of securing for him complete convalescence and a return to full vigour, these disabilities persist too long or result in some degree of permanent unfitness. There are many directions in which the same conclusion is reached. In a discussion at the Liverpool Medical Institution, reported in our last issue, Dr. H. E. MOORE, speaking as a railway surgeon, made it clear how much of the wastage resulting from industrial injuries is avoidable; for, he said, if only proper treatment had been given at an early stage, many instances of long incapacity might have returned to their former occupations in quite a short time. Surgical supervision adequate at the start, becomes too spasmodic to be effective, and he counselled the setting up of traumatic centres throughout the country controlled by orthopædic surgeons of experience and providing free facilities for insured persons whose convalescence from injuries was proving tardy. It was pointed out in the same discussion how, in the presence of a minor disability, allowed to remain after an injury, even a keen worker was prone to fear the moment of his return to work, from the feeling that his incapacity might increase and lead to discharge on the grounds of inefficiency. On this account even trivial injuries are apt to cause undue delay in returning to full work.

Convalescence has been paraphrased rather neatly as the after-treatment of hospital patients, and the problem is not to be solved by prolonging the stay in hospital, for quite apart from expense it is undesirable for the patient's psychical condition for him to stay longer than necessary. The difficulty is world-wide. From a letter by Dr. G. KAHLMETER to the *Archives of Medical Hydrology* (January, 1933, p. 121), it is clear that in Stockholm large numbers of patients are retained unduly long in hospital owing to the difficulty in placing them. They ought to leave sooner for, Dr. KAHLMETER tells us, the hospital atmosphere makes them depressed, and the difficulties—not to say aversion—which they experience on returning to their old work and home surroundings become greater with lapse of time. On the other hand, if sent home too early they are as a rule forced immediately to resume work which is beyond their strength at the time, and the benefit derived from the hospital treatment is thus nullified and their general condition aggravated, or the malady relapses. Many patients are instinctively afraid of this, with the result that their mental state during the latter part of their period in hospital is often disquieted by worrying about too early a discharge. It will be noted how closely Dr. KAHLMETER'S experience agrees with that recorded by the Liverpool surgeons. How is this awkward period between hospital discharge and resumption of work to be filled in to the best advantage of body and mind? It should not, as we have seen, be spent in the hospital atmosphere, nor is the return to unsupervised home life any nearer the ideal. Most of our experience of the means of filling up this interval has been gained from the experience of institutions where the interval is so long that something has to be done about it. In the prolonged convalescence of mental disease and of acute tuberculosis great centres have arisen in which treatment of one kind or another has been tried out. Some of the county mental hospitals from time immemorial have been setting the employable patients to tasks fitted to their condition, and yet of a sufficiently interesting and productive character to engross their attention and make them feel a growing sense of responsibility for their own lives. In the treatment of phthisis the same tendency may be seen to make the conditions of convalescence resemble more and more closely those of domestic or working life lived under supervised conditions. It is curious how the industrial colony, under one or other name, has

[1] The Last Essays of Elia: the Convalescent.

arisen as the spontaneous idea of a sanatorium director, impressed by the results of relieving the physical results without considering the mentality of the patient.

But it is all too evident that in these straitened times the means would not be available for such residential treatment of all ex-hospital patients, even if it were desirable. Convalescent branches in the country are attached to many metropolitan hospitals, and Edinburgh has an example of what can be done in systematising an institution for efficient convalescence. More institutions of this kind there should certainly be, but in the meantime it remains for us to devise under simpler conditions what Dr. KAHLMETER wisely calls "qualified convalescent treatment." In the hospitals it involves the creation of a social service department as a unit complementary to the medical, surgical, and pathological units of the hospital, and outside the hospital it implies additional facilities for the general practitioner who is at long last the only judge of whether a patient is or is not restored to his normal working capacity. It is difficult to think that the need can be completely met other than by the formation of general practitioner clinics, and once again we come back to the proposals of the Dawson report of 1920, which, like those of the Golden Rule, have not been discredited, because they have never yet been put in practice. The primary health centre, foreshadowed in that report, was to be an institution equipped for services of curative and preventive medicine, conducted by the general practitioner of the district, in conjunction with an efficient nursing service and with the aid of visiting consultants and specialists. Among the equipment there would be baths, apparatus for physical culture, and so forth—in a word, convalescent treatment; with the addition of the occupational therapy as generously defined by Dr. NORAH HAWORTH on p. 171 of this issue. Liberally construed, these primary health centres might develop into recuperative centres, serving the double purpose of restoring patients to health after illness or before their illness has become disease.

## HORMONES AND MENSTRUATION

THE attention of the general reader is being drawn more and more insistently to the sex hormones. Even within the last few months a further liveliness has been apparent on the physiological and biochemical front, and every few weeks we are confronted with fresh and well-authenticated statements that would have seemed incredible a few years ago. Prof. WALTHER SCHOELLER'S review in our issue of Jan. 7th illustrated this progress and showed once more that here is one of the most exciting and promising branches of research. At the same time it did not disguise that as yet there has been more promise than performance, so far as clinical medicine is concerned. Looking at Prof. SCHOELLER'S pictures the practitioner must have wished that his patients were potted hyacinths or lilies and would benefit accordingly by small doses of his elixirs. But the gulf even between man and the rabbit remains a wide one, and meanwhile one must recognise that though progress in laboratory experiment has been clear-cut and continuous, the application of the experiments to clinical work has been far from satisfactory. Apart from the very valuable Aschheim-Zondek reaction, the laboratory methods have been more or less a failure when applied to gynæcological diagnosis. On the therapeutic side there is such a mass of conflicting evidence that it is almost impossible to arrive at any definite conclusion. One school of workers, for example, maintain that the action of the follicular hormone (œstrin) obeys the definite body-weight ratio rule, and hold that thousands of units would have to be administered to a woman before any results could be expected. Another school, on the other hand, claim to have achieved definite results by means of small doses of this hormone administered subcutaneously. The difficulties in interpreting any results of this type are very real. In the treatment of any form of amenorrhœa, for instance, the possibility of spontaneous menstruation is so great that it cannot be ignored; while improvement in subjective symptoms, such as those of the menopause, renders quantitative observations impossible.

Œstrin is, by definition, the œstrus-producing hormone *—that is to say, it will induce an œstral cycle in castrated animals. It might be thought therefore that it would induce menstruation in women, and it has, in fact, been used with this object. But œstrus and menstruation are far from being synonymous, and work on monkeys has shown that bleeding induced by injections of œstrin is merely hæmorrhage from an "interval" type of endometrium. Immediately after menstruation, it is believed, the ovaries are inactive and the endometrium is at rest. From about the tenth to the fourteenth day (the "interval") the ovaries contain ripening follicles and the endometrium is hypertrophied—this hypertrophy being attributed to the secretion of œstrin. Then comes the premenstrual or corpus luteum phase—far more prominent in man than in other animals—when the endometrium prepares itself, under the influence of the corpus luteum, for nidation of the ovum. Failing conception, degeneration of this proliferated epithelium takes place and is manifest as menstrual loss. And if this theory is correct it is necessary, in order to produce artificial menstruation, not only that the uterine mucous membrane should be sensitised by the follicular hormone, œstrin, but also that it should go through a pregestational stage under the influence of another ovarian hormone, the "progestin" poured out by the corpus luteum. Prof. SCHOELLER mentioned that menstruation had now been produced by these means in the human female after double oöphorectomy, and Dr. C. KAUFMANN'S account of this important experiment has just appeared.[1]

* Preparations of the follicular hormone, œstrin, are sold under the names of theelin, progynon, menformon, and sistomensin.

[1] Zentralblatt f. Gynäk., 1933, No.1, p. 42.

The patient was a woman who had both ovaries removed five or six years ago, at the age of 17, for dermoid cyst. Her periods had previously been regular. In the middle of October last he began to treat her daily with progynon benzoate—a preparation of œstrus-producing hormone—intramuscularly; and from Nov. 10th to 18th he also administered 10 rabbit units every day of luteal hormone (Schering-Kahlbaum A.G.); the total dose was 320,000 mouse units of progynon and 90 rabbit units of corpus luteum extract. In 24 hours after the last injection of luteal hormone bleeding began. The total quantity in the first day was 20 c.cm. of a viscous, dark red blood in which no epithelial debris could be seen microscopically. When removed after 36 hours the pessary contained a large fragment of tissue which proved to be a piece of uterine mucosa. Bleeding continued for another 30 hours, and the total quantity lost was 40 c.cm.

Dr. KAUFMANN claims, from the microscopical examination, that the bleeding was a genuine menstruation. He points out that the success of the experiment depended on the large amounts of hormone used, the dose being determined from former estimation of the quantity present in the urine of healthy women.

These may seem small matters, if looked at without the eye of faith. But it has to be remembered that the substances now being used in small doses are no longer utterly obscure in constitution, and therefore far beyond control. This was evident from the tentative formulæ we printed a fortnight ago, and even in the short time since then there is news of a notable new advance. In a letter to *Nature* (Jan. 7th), Mr. J. W. COOK, D.Sc., Prof. E. C. DODDS, and Mr. C. L. HEWETT, of the research institute of the Cancer Hospital and the Courtauld institute of the Middlesex Hospital, state that they have found, for the first time, a synthetic organic compound, of know constitution, which has definite œstrogenic properties. On the hypothesis that the follicular hormone or hormones are formed by degradation of sterols they took as the starting-point of their investigations 1-keto-1 : 2 : 3 : 4-tetrahydrophenanthren. Though feeble in comparison with œstrin, this proved capable of producing œstral reactions in castrated rats. The importance of this is obvious; but it may be more important even than it seems. Not only has this substance, in its molecular structure, points of resemblance to that suggested for ketohydroxy-œstrin, but in the opinion of these workers it may also form a bridge between the sex hormones, the carcinogenic hydrocarbons, and substances of the fused-ring type, such as cholesterol and vitamin D.

## MINERS' NYSTAGMUS

IT might have been expected that the questions connected with miners' nystagmus would long before now have been settled. Two reports on the subject by a committee of the Medical Research Council were issued in the years 1922 and 1923. The principal finding of this committee was that the chief symptom of the disease—namely, involuntary oscillation of the eyeballs—was caused by an insufficiency of the light reaching the eyes of the miner while at work, and that of all measures of prevention the most important was to secure for the miner at work an adequate illumination. The Medical Research Council have meantime found it advisable to reconstitute this committee, and they have now issued a third report [1] which deals with the situation as it exists to-day. The alarming fact which the committee have had to face is that in spite of a considerable improvement in the illumination of the mines which has been secured in accordance with the recommendations of the first committee, the incidence of the disease known as miners' nystagmus, as judged by the numbers of those who have been awarded compensation, has, on the whole, steadily increased, the total number of persons to whom compensation was paid having increased from 1618 in 1910 to 7028 in 1920 and 10,638 in 1930. In essaying to account for this formidable increase, the present committee are firm in their support of the main conclusion of the former committee, that the fundamental cause of miners' nystagmus in the narrower sense of the term—i.e., oscillations of the eyes—is the low illumination under which miners in general work, and they adduce weighty evidence to prove that in several mines where a defective system of lighting has been replaced by an adequate system, the results have been so favourable as to confirm this view, and to encourage the policy of introducing improved lighting in all mines where the workers are subject to nystagmus. To account for the actual increase in the "disease known as miners' nystagmus" it is necessary to look in an altogether different direction—namely, to the fact that the disease, as officially defined for purposes of legal compensation, consists not only of eye oscillations, indeed may exist without any eye oscillations at all, but, whether combined with or apart from that particular symptom, is made up of various "nervous" symptoms, some of them connected with the eye, such as photophobia, night-blindness, or temporary loss of visual acuity, others wholly apart from the eye and akin to those with which the Great War made us familiar under the terms "shell shock" or "disordered action of the heart." As the report puts it: "it is not sufficiently recognised that the attribution of nervous symptoms to a physical cause is a probable factor in the evolution of the compensated disease." Owing to the apparent negligence with which the definition of the disease entitling to compensation has been framed, there has been a fatal tendency to slipshod diagnosis, and unfortunately the prospect of securing compensation has undoubtedly acted as an encouragement to the patient to make the most of his symptoms.

The outcome of the investigation is that so far as oscillation of the eyes is concerned this symptom has been proved to be connected with an insufficiency of light while at work. The phenomenon is based on the fact that in a condition of complete dark adaptation the peripheral parts of the retina are more sensitive than the central parts and the

[1] Third Report of the Miners' Nystagmus Committee. Medical Research Council: Special Report Series No. 176. H.M. Stationery Office. 9d.

habit of macular fixation may be suspended or even lost. It is found however that even in cases where nystagmus is fully developed there is not necessarily incapacity. Frequently miners with oscillation remain at work entirely unconscious of their condition. In many cases, on the other hand, oscillation of the eyes involves apparent movement of objects, with dizziness and headache. If the disability remains at this stage the question of psychoneurotic factors does not arise. Often however it does not stop here, further developments occur, and what at first sight seemed to be an ocular disorder pure and simple takes on the aspect of a psychoneurosis—i.e., a condition which may be one of actual disability but one not amenable to modes of treatment familiar to the ordinary medical practitioner, and requiring knowledge of psychoneuroses in general and experience and tact in dealing with them.

The report is accompanied by two appendices, the first by Prof. MILLAIS CULPIN containing an analysis of 36 cases receiving compensation examined by himself, in which he has made note of the nervous conditions of the patients. In only 3 of these cases was oscillation evident while the patient was being talked to. In 11 it could be elicited by special motions of the eyes, and in 22 it was not seen at all. In almost all there were psychoneurotic symptoms such as irrational fears, present to a greater or less extent, and in this connexion Dr. CULPIN points out that in coal mining the danger that actually exists of explosions and other catastrophes, may prey on the minds of some men more than others, making them peculiarly liable to a "nervous breakdown" of some sort, just as the terrible conditions to which soldiers in the trenches were subject rendered some more than others liable to "shell shock." Only in two cases did he suspect actual malingering, and this fact is important as otherwise the uninstructed might fail to realise that these nervous symptoms actually do involve a disability calling for proper treatment. The important point is that treatment to be effective must be mental, and that to provide hope of compensation dependent on continuance of the disability is the very worst form of mental treatment possible. This point is further illustrated in the second appendix by Dr. T. L. LLEWELLYN. "The incidence of miners' nystagmus in individual pits is very irregular," he says, "and is largely influenced by conditions of unrest, local dispute, and custom. The looseness of the scheduled definition allows the inclusion of men either not suffering from the disease or not incapacitated by the disease." As to the good effect of improved lighting there can be no doubt. Between 1920 and 1928 the proportion of electric to oil lamps was increased from 28·0 to 47·0 per cent., but that was not enough. A poor electric lamp is a worse source of illumination than a poor oil lamp, and whole installations of electric lamps have been rendered useless by lack of attention to batteries. In many cases the electric lamps gave a poor light and did not last the shift out. More recent reports of mines where electric cap lamps have been provided or electric hand lamps of as much as 4·5 candle power show much more favourable results.

The main recommendation of this important report, in its final words, is "that the practical treatment of the disease, from an administrative point of view, should consist in the elimination of a hopeless dependence on compensation by the provision of opportunities for work of some kind, the end in view being complete restoration to full work underground, under conditions of proper illumination, even if this has to be preceded by a period of work in daylight."

## COLDS AND INFLUENZA

INFLUENZA is once again in our midst; the season of the common cold is reaching its acme. Such a time is a propitious one to pass in review the endeavours which are being made to gain a more intimate knowledge of these conditions. And since so much turns on a precise understanding of the ætiology of any disease it is this aspect of the problem which should concern us primarily. In the past, as was only natural, investigations into the causation of the common cold were largely concerned with the incrimination of a cultivable bacterium. There has been no lack of these; the choice was embarrassing, as the composition of the anticatarrhal vaccine testifies. But no cultivable bacterium has been isolated from coryza, which was at once peculiar and common to all cases of this disease, and with the exception of man there was no suitable experimental animal on which to try out the various claimants. Further, the common cold, from the clinical point of view, appeared to be an entity, and this suggested that the different bacteria present in the nasopharyngeal discharge were merely secondary invaders, and that the prime cause had yet to be found. This impasse gave birth to the view that a filtrable virus was to blame, a view which recent work has gone a long way to confirm, and although DOCHEZ and his colleagues in America were not the first to endeavour to provide experimental proof of this hypothesis, the thoroughness and care with which they approached this problem makes their work a landmark in this field of research.

Readers of THE LANCET are already familiar with the work of DOCHEZ,[1] and there is no need to review it again in detail. Suffice it to say that he and his colleagues envisaged in turn the ætiological significance of cultivable aerobic bacteria and filter-passing anaerobes, only to discard them; and then proceeded to demonstrate the possibility of reproducing typical colds both in chimpanzees and human volunteers by means of the filtered nasopharyngeal washings from spontaneous cases. P. H. LONG and a team of workers[2] at the Johns Hopkins University have repeated these experiments using human volunteers only, and obtained similar results; and more recently C. H. ANDREWES and

[1] Dochez, A. R., Mills, K. C., and Kneeland, Y.: THE LANCET, 1931, ii., 547, 539.
[2] Long, P. H., Doull, A., J. Brown, J. M., and McComb, E.: Jour. Exp. Med., 1931, liii., 447.

W. G. OAKLEY,[3] at St. Bartholomew's Hospital, have had a like success. They, too, made use of human volunteers, and tested in all the filtered nasal washings from ten people with colds. Of these filtrates five proved active, and with them they produced typical colds in 15 out of 36 men inoculated, a proportion of success closely approximating that obtained by DOCHEZ and by LONG. ANDREWES and OAKLEY were, however, unable to confirm DOCHEZ's claim to have cultivated the virus. Cultures made by them according to DOCHEZ's technique proved inactive when tested on 24 volunteers; and even DOCHEZ, who came over to this country at the time, bringing with him his own cultures, was not any more successful, so that his claim to have grown the virus cannot yet be accepted. Yet the main portion of his work stands intact. The prime cause of the common cold is a filtrable virus.

[3] Andrewes, C. H., and Oakley, W. G.: St. Bart.'s Hosp. Jour., Jan., 1933, p. 74.

With influenza progress has been less satisfactory. The difficulties encountered in the experimental investigation of the common cold are not less in the case of influenza; in fact they are even greater. The use of human volunteers in work on the common cold is one thing, their use for influenza quite another. There are several ætiological claimants in the field—filtrable virus, *Bacterium pneumosintes*, Pfeiffer's bacillus—the difficulty is to decide between them, and unless a suitable experimental animal is found progress will be held up indefinitely. With regard to specific prophylaxis in these two diseases, it must not be forgotten that the natural disease does not appear to confer much immunity—at best it is only short-lived—so too much must not be expected from artificial measures. There remains, however, prophylaxis against the secondary invaders which play an important part, especially in influenza, and this is catered for by the vaccines already in use.

# ANNOTATIONS

## DRUG AND ALCOHOL ADDICTION IN GERMANY

UNTIL recently Germany has had a somewhat heavier drug problem to deal with than Great Britain, possibly because of her large land frontiers and possibly because of a temperamental factor. Dr. Paul Wolff, one of the two editors of the *Deutsche medizinische Wochenschrift*, who does much work on the drug and alcohol problem for the League of Nations, told the Society for the Study of Inebriety on Jan. 10th of the far-reaching effects of the new ordinance which came into force on April 1st, 1931. Statistics published in 1928 indicate that Germany had between 4000 and 6000 addicts out of a population of about 64,000,000, and that this figure included about 500 doctors. Germany has not the provision which this country has for depriving a doctor who is an addict of the right to prescribe dangerous drugs, but a measure to this effect is expected. The ordinance of 1931 restricts the right of prescribing opiates, and compels a doctor to keep a record of a larger prescription than 0·1 g. of morphia or 2 g. of opium daily. Heroin, which in Germany is called diacetylmorphine, seems to play very little part in that country; for some reason it has no attraction for the would-be addict. The law discriminates in favour of suppositories as against injections. Since the promulgation of this ordinance the consumption of morphia has been reduced by about 20 per cent. and that of opium by about 30 per cent. Similar restrictions aimed at the use of cocaine have resulted in a decrease of 50 per cent., and an additional drop in consumption is expected when the 1932 figures are available. Its use is confined now almost entirely to ear, nose, throat, and eye operations, subject to certain provisos. The pure substance is no longer supplied to the medical profession, and specialists have found that the modern substitutes are equally efficacious. Dr. Wolff states from personal observation that the illegal drug traffic in Berlin is very much on the wane.

The German authorities have also made a determined attempt to reduce alcoholism. The Licensed Premises Act of July, 1930, imposed restrictions on the granting of licences, defined opening and closing hours, and provided for the prohibition of the sale of spirits at certain times, such as pay-day and election days. The chief object of the measure was to prohibit the sale of alcohol to persons under 18 and intoxicated persons, and the sale of tobacco to children under 16; also to stop the practice of charging extra for meals at which no alcohol was drunk, and to forbid the sale of spirits on sports grounds and in gymnasia. The present consumption of spirits in Germany is only 20 per cent. of what it was in the first decade of the century, and the consumption of beer only 31 per cent. Chronic alcoholism is on the downward grade and delirium tremens has become very rare. The mortality from alcoholism in German hospitals is about one-third of what it was before the war. The whole treatment of inebriety throughout the country is systematically organised through the various temperance societies, and is carried out both in general hospitals and in special institutions administered by the State. Particular importance is attached to treatment in the early stages. The draft of the new German Penal Code contains provisions whereby a judge can enforce a withdrawal cure and order supervision of an inebriate. One of the best prophylactic measures, Dr. Wolff remarked, has been the raising of the price of alcoholic liquors by taxation in proportion to the alcohol content.

## PROBLEMS OF DEVELOPMENT

ALL who are interested in fundamental biological problems, or are concerned with their bearing on related questions, should consider the authoritative work of Bernhard Dürken which has recently been made available in English.[1] Prof. Dürken is a supporter of the *Einheitstheorie*, and it is his subtle analysis of the claims of opposed views about the development of the organism which is of special interest. We have been presented in recent years with such exact experiment and accurate forecast by the geneticists and investigators of heredity, that almost unconsciously we have come to look upon the development of the whole organism as in the keeping of chromosomes, built up of genes which are the actual

[1] Experimental Analysis of Development. By Bernhard Dürken, professor in the University of Breslau. Translated by H. G. and A. M. Newth. London: George Allen and Unwin, Ltd. 1932. Pp. 288. 14s.

producers of the various characteristics. The idea of the chromosomal ordering of the organism from its commencement, however, has not seemed entirely satisfactory. It does not fit in with the facts of wider experience: for example, such phenomena as sex-reversal, regeneration, and the results of experimental transplantation and the like on young embryos were apparently firmly established, but would be incompatible with the theory that the development of the ndividual characteristics are fixed ab initio. Although interaction between chromosomes and their environment be brought in, the incompatibility must remain so long as the constitution of the chromosomes is considered to be fixed from the time of fertilisation. It is, then, with something like relief that one encounters the effort of Prof. Dürken to adjust the differences in ideas on the nature of development of the geneticists and of the experimental embryologists. He shows that the results of these last prove the epigenetic nature of development, opposed to the (theoretical) development on a purely chromosomal basis, which, as he maintains, is essentially preformistic in character. The way is open now for readjustment. It is surely reasonable to hold that if any experimental work can throw light on the processes of development, experimental embryology should be able to do so; and this work certainly favours the epigenetic nature of the processes. Thus the rigid chromosomal direction of development is automatically put out of court. On the other hand, genetical theory was introduced for students of heredity, and as a working theory has brilliantly served its purpose. Cytological research has shown that the theory may be nearly true within its own field; but that field is not the general development of the organism. Chromosomes exist in fact, although they do not have continuous existence, and, like all intracellular structures, must undergo epigenetic change. The gene, the lineal descendant of Weismann's determinant and, like it, of more than doubtful material existence, is also subject to epigenetic change, whatever its nature. The conception of this abstract or material gene as the last term in an epigenetic series, expressing itself in the final "characteristic," is one that fits in well. The final philosophic sections of this work, at any rate, give the reader more satisfaction than can be found in the developmental theories based on rigid chromosomal foundations. A word is due to the translators. Like Mundinus, they say that they have not aimed at elegance of style, wishing rather to preserve or reproduce the author's thought without gloss. There is no internal indication of want of elegance, though the English is clear and simple.

## THE PROGENY OF SCHIZOPHRENICS

IT is common knowledge among psychiatrists that schizophrenics are often childless, but this general impression lacks the support of extensive and accurate statistical analyses. In an attempt to contribute precise information on this point Dr. A. J. Nissen,[1] who is attached to the Norwegian Public Asylum of Rotvoll, has investigated the number of children born to 322 schizophrenics treated at the asylum between July, 1929, and April, 1932. The main facts emerging from this study were the comparative rarity of marriage in this class, the comparative sterility of these few marriages, and the high ratio of illegitimate to legitimate children born to schizophrenics. Altogether only 226 children, legitimate and illegitimate, were born to these 322 patients, who were classified in age-groups to facilitate their comparison with corresponding age-groups in the general population. The census of 1920 provided a not altogether satisfactory control material, as the birth-rate in Norway has declined between this year and 1932. While in the general population in 1920 only 9·43 per cent. of the married women were childless, this was the case with 24·4 per cent. of the 41 married schizophrenic women. Again, in the general population there was an average of 4·02 children every marriage, whereas this average was as low as 2·67 for the married schizophrenics. These figures are, of course, too small to warrant far-reaching conclusions; and there are other sources of error frankly discussed by Dr. Nissen. But with these reservations he has made out an interesting case for the further study of schizophrenia on the same lines. Indirectly such information, thus obtained, may throw light on the part played by heredity in the genesis of schizophrenia.

[1] Nordisk Medicinsk Tidskrift, Dec. 3rd, 1932.

## MELILOT AND MALARIA

FOR many years it has been popularly supposed in many regions of Africa and Asia that certain species of melilot, a kind of clover, can usefully be grown as a prophylactic against malaria. It will be remembered that Grassi in his closing years raised the important question of the prevalence of anophelines in association with the purity of the water-supply. "Brackish water," he said, "increases the virulence of the malarial parasites." But during his travels in the Argentine he noted that the highly scented blossoms of the scented clover (*Melilotus altissima*) were much frequented by anophelines, which fed upon their juice, and that this plant was not present in malarial districts. The juice of this clover contains a glucoside, coumarin, and he thought it possible that this substance might play a part in the insect comparable to that which quinine plays in man. It will be remembered too that the late Sir William Willcocks tentatively attributed the comparative freedom of Egypt from malaria to the influence of this plant. In 1920 Dr. F. d'Herelle was appointed director of the bacteriological service of the International Quarantine Council of Egypt, and took with him a quantity of seeds of the scented clover known by the Spaniards as "trebol de olor"; but owing to the prevalence of clover in Egypt he was unable to make any extensive experiments with it. Two years ago Stratman-Thomas tried to verify the clover hypothesis in the Mississippi valley. He selected fields where alfalfa had been planted from one to three years, and made an index of the incidence of malaria at various distances from these fields, but he could not find any significant difference, and concluded that the action of clover was nil. d'Herelle[1] himself is unable to accept this negative experiment, and considers that observations made in various regions of the world seem to indicate that the primary cause of "anophelism without malaria" is the presence of plants of the genus melilotus, or of some other genus having the same property and containing coumarine in their honey. The outlook for this theory, nevertheless, does not seem to be promising. Those who have worked on malaria in the Delta of Egypt are aware of the existence of endemic foci of the disease in close contact with the clover crops. The explanation of the absence of malaria from the greater part of the Delta appears

[1] Amer. Jour. of Hyg., 1932, xvi., 609.

to lie in the fact that owing to the prevalence of fish in the main canals and the excellent system of drainage, there are no adequate breeding-places or hibernating-places for anopheline mosquitoes of the appropriate species.

## B. SUIPESTIFER AS A CAUSE OF DISEASE IN MAN

*Bacillus suipestifer*, a member of the salmonella group, was first brought into prominence under the name of the hog-cholera bacillus (*Salmonella choleræ-suis*, as it is often called in America) as the cause of hog cholera or swine fever. However, while this bacillus is frequently isolated from cases of swine fever, it is now regarded as being not the causal organism but a secondary invader. Much confusion has been caused by a plurality of names, and especially by the use of the term *B. suipestifer* without exact serological definition; but actually this organism is only rarely found to be a cause of human disease. Some continental investigators go so far as to question its pathogenicity to man, while W. G. Savage and P. B. White [1] in 1925 regarded it as an organism of low virulence to man, which can set up an outbreak of food poisoning "only under exceptionally favourable conditions." Further experience, however, showed that it was less rare than had been supposed, and W. M. Scott in 1926 described four separate outbreaks of food-poisoning in this country, in which over 100 cases in all of gastro-enteritis occurred, one being fatal, and in which the bacillus incriminated was *B. suipestifer* (sub-type 2). Savage and White had previously included one outbreak in their series, while at least three outbreaks have been described in U.S.A. These facts seem to establish this organism as a cause, though not a frequent cause, of food-poisoning outbreaks. As usual with the salmonella group, the problem is complicated by further differentiation into sub-types, and there are now three types which have to be considered. One sub-type, generally known as *B. paratyphosus* C, is associated with human disease of the paratyphoid fever type, but, with rare exceptions, is found only in the East, in places such as India, Mesopotamia, and the Balkans. It is separable from, but closely allied to, the two other types. The true suipestifers fall into two sub-types. Sub-type 1, the *American* type, is almost exclusively confined to that continent, and is the type isolated from American swine. It has serological differences and cultural distinctions, such as its failure to blacken lead acetate and its inability to ferment dulcite and arabinose. Sub-type 2 is the Western European type. This is the type which is isolated from swine fever infected swine in this country, and is the one associated with suipestifer food-poisoning outbreaks. This type regularly and rapidly blackens lead acetate and ferments both dulcite and arabinose. That *B. suipestifer* may cause sporadic disease other than food-poisoning in this country has recently been shown by Nabarro and his collaborators,[2] who cultivated this organism from the joints of two children suffering from arthritis. Several isolated cases of paratyphoid fever-like nature due to this bacillus have also been reported in U.S.A.

The story is carried a stage further in a valuable paper by A. G. Kuttner and H. D. Zepp which has just been published.[3] During the winter of 1931–32, within a period of four months, seven children with ages ranging from 7 months to 6 years were admitted to the Harriet-lane Home, Johns Hopkins Hospital, Baltimore. All the cases were entirely unrelated. They were admitted for acute febrile disease of paratyphoid fever type, but showing considerable differences; none was of food-poisoning type. In every child there was definite blood infection, *B. suipestifer* being isolated from the blood. It is of interest that in only one case, in spite of repeated examination, was the organism isolated from the fæces or from the urine. The course of the disease was mild, there were no recurrences or complications, and all the patients recovered after a period of 14 to 29 days in hospital. The bacteriological investigations were carried out with great care. The fact that six of the strains isolated were found to belong to sub-type 2 and one to sub-type 1 is of great interest in view of the known geographical distribution of these three sub-types.

From the different cases recorded we now know that *B. suipestifer* (sub-type 2) can cause disease in man, either in the form of an outbreak of food-poisoning or as illness of the type of paratyphoid fever. It must still be regarded as a rare cause of human illness, but further experience may show a greater prevalence than the reported cases suggest. The sub-type of salmonella found is of importance from the point of view of causation. In the cases of Kuttner and Zepp no sources of infection could be found, but they suggest as most probable infection from specifically infected pork. Since *B. suipestifer* is an organism often associated with swine fever, and undetected cases of this disease may be sold as food, it cannot be excluded as a potential source of infection. The likelihood that it was actually the causal organism in the cases described by Kuttner and Zepp is discounted by the fact that in all but one child the strains were of sub-type 2, whereas the ordinary type in swine in America is sub-type 1. In England this discrepancy does not exist, since all the positive types isolated by White [4] were of sub-type 2, and therefore of the same sub-type as those found in food-poisoning outbreaks. Obviously still more detailed study is necessary before causal factors can be fully established. All that can be said at present is that suipestifer strains from pigs, and probably also from other animals, seem to be of rather low virulence to man, though potential causes of human infection.

[1] Med. Research Council, Spec. Rep. Series No. 91, 1925.
[2] THE LANCET, 1929, ii., 868.
[3] Bull. Johns Hopkins Hosp., December, 1932, p.
[4] Med. Research Council, Spec. Rep. Series No. 103, 1926.
[5] See THE LANCET, 1932, ii., 687.
[6] Acta Pædiatrica, 1932, xiv., 1.

## THE RESPIRATION OF NORMAL CHILDREN

THE increasing interest taken in the physiology of respiration and its application to clinical problems [5] is illustrated by a recent paper [6] from the University Children's Clinic in Amsterdam. Dr. M. de Bruin, who was investigating with a special type of recording spirometer various problems of basal metabolism in normal children, found that analysis of the curves obtained gave some indication of the normal respiratory functions of the child. In a group of 50 normal children he paid attention to four factors: (1) the rate of respiration over a period of 18 minutes; (2) the depth of respiration, that is the tidal air, from an average of a hundred breaths; (3) the minute volume; and (4) the relationship between respiration and basal metabolism. Great variability was found in the rate of respiration; in 26 boys of ages between 2½ and 10 years the rate varied between 14 and 40 with an average of 23 per minute. The difference on successive days for the same child was only slight, and no reason could be found for

a rate of, say, over 30 in certain circumstances. In the 24 girls of the series the same constancy of rate for the individual child was found, while the rate from child to child varied from 14 to 35 with an average of 23. A similar gross variation from child to child, with a remarkable constancy for the same child, was found in relation to the tidal air. The smallest value found was 174 c.cm., the largest 378 c.cm.; in general the children with the rapid rates had lower tidal air values. One exception showed a high-frequency and big tidal air volume on one day with a lower frequency and small tidal air volume at a later date, but no cause could be found for this. Despite the general finding of inverse variation between tidal air and frequency the minute volumes in the series showed wide variations from eight litres to four litres. Dr. de Bruin suggests as a possible explanation that some of the higher values occur with very shallow breathing, a high minute volume being associated with poor ventilation in the alveoli. This was put forward in a paper from Buenos Aires, recently mentioned in these columns.[7] It is also important in any consideration of minute volume to relate this to the oxygen requirements of the body, as taken alone the ventilation has no absolute value unless body requirements are correlated. Dr. de Bruin consequently compared his estimates of minute volume with basal metabolism findings. The relation, however, was not very close. Of six cases with large minute volumes four showed a basal metabolic rate above the standard, while two were below. In 14 children with low minute volumes seven had raised metabolic rates, six showed lowered values, and one agreed with the standard rates. These findings do not altogether agree with the results of other workers. This may be in part explained by the type of spirometer used and the fact that tidal air was measured as depth of normal inspiration rather than depth of normal expiration. The number of cases investigated was small. Nevertheless Dr. de Bruin's findings are of intrinsic interest and illustrate well the close connexion between physiological and clinical research.

## DANGEROUS DRUGS: A MODEL CODE

IN anticipation that the Convention of 1931 dealing with the limitation of the manufacture of dangerous narcotic drugs will be duly ratified and come into force this year, a model code has been drawn up by the Opium Advisory Committee of the League of Nations and circulated. It is hoped that this will expedite ratification and enable the various governments to frame the necessary legislative and administrative measures for application of the new Convention. During the discussion by the Council of the model code, Mr. Wellington Koo, the representative of China, remarked that it was in the matter of dangerous drugs alone that the League of Nations had succeeded in drawing up a model administrative code. He added "that a closer approximation to world uniformity of legislation had been reached in the field of dangerous drugs than in most other fields of international activity." M. de Madariaga, representing Spain, recalled that League experience in regard to narcotic drugs proved that the real source of the evil was the manufacture rather than the traffic, and suggested that this experience might usefully be communicated to the disarmament conference, where control of manufacture was no less important than control of traffic. The draft model code contain suggestions as to the connotation of "narcotic drugs," "reserve stocks," and "government stocks," and deals with methods for determining the annual estimates to be furnished by each government which form the basis of the plan for limitation of manufacture. It has made clear from the official statistics available that the stocks in existence at the end of 1931 were sufficient to meet all the scientific and medical needs for at least a year. As regards illicit traffic, it is interesting to note that in 1931 the United States of America were the chief victims of such traffic. The quantities there seized in that year were of raw opium 1389 kg., of morphine 258 kg., of heroin 238 kg., and of cocaine 5 kg. The Council of the League meets on Jan. 23rd, when it is hoped that progress may be reported as regards ratification of the Limitation Convention; and the Central Opium Board will hold its next meeting at Geneva on Jan. 25th.

## CARBON MONOXIDE POISONING AND MOTOR ACCIDENTS

ON another page Dr. J. S. Owens writes on the risk of carbon monoxide poisoning which arises from the general use of motor-cars. It is, as he says, hard to be sure what damage may be done to people exposed to exhaust gas in small doses over long periods, and in France the statement has lately been made that drivers of public service vehicles suffer a degree of chronic poisoning which increases their liability to accidents. Cazeneuve, Tanon, and Neveu,[1] who have already written on the subject in the hope of ensuring that the examination of drivers in the provinces shall be carried out in accordance with the law, have made 4000 examinations and say that one driver out of every four shows unequal dilatation of the pupils. They have carefully eliminated any possibility of syphilis, and ascribe the symptom to an intoxication of the grey matter of the medulla. Testing 15 of their friends, they found that ten showed inequality after driving a closed car with all the windows shut; mydriasis, as in the public service drivers, was always on the left, and return to normal took place after intervals varying from one to eight hours. Inhalation of petrol fumes produced similar effects in certain subjects. In three cases of accident where the driver had complained of faintness just before the collision, they found obvious leakage of exhaust gas through the floor boards, and consider that many mishaps must be due to this cause. They think that certain drivers are more sensitive than others, and that alcohol or over-eating predisposes to this form of intoxication.

## MANCHESTER AND PASTEURISATION

MANCHESTER has temporarily lost her reputation for sound sense. About a year ago the public health committee approved the proposal of Dr. R. Veitch Clark, the medical officer of health, that the city should take powers to insist that all milk—other than Certified and Grade A (tuberculin-tested)—sold within its borders should in future be pasteurised. This proposal was rightly accepted by the city council and was embodied in one of fifteen clauses in a new Corporation Bill. The Bill, before going to Parliament, had to be submitted to a town's meeting, and the opposition to some of its provisions was so well organised that five of the clauses, including compulsory

[7] THE LANCET, 1932, ii., 1345.

[1] Bull. de l'Acad. de Méd., 1932, cviii., 1624.

pasteurisation, were defeated. It would then have been possible to ask for legislation on the non-controversial questions, but the city council, which approved of the Bill by a large majority, preferred to submit its proposals to a poll of the local electors. The result was disastrous. Anxiety to destroy particular clauses united the forces of the property-owners' association, the ratepayers' association, and the local branch of the National Farmers' Union, and the electors were freely advised that they would be wise to vote against the whole Bill if they objected to any part of it. Although the poll of over 45,000 was unexpectedly heavy, it represented only about 14 per cent. of the total electorate, and because of this general apathy the strenuous and artificially united opposition was able to win the day. Of the 15 clauses one was approved—and it had nothing to do with local government. Yet even the permission to the Royal Infirmary to control certain land and establish clinics and paying wards was granted only by the narrow majority of 1180, and it is reasonable to think that the 21,000 persons who voted against this entirely non-controversial scheme formed a group which was opposing all the items, regardless of their individual merits. It was clear, as the Lord Mayor said afterwards, that reason scarcely entered into the voting, and many people will agree with Alderman G. F. Titt, that the result was "a triumph of organised vested interests against good government."

Dr. Veitch Clark's scheme was an attempt to put in practice a policy—originally outlined, we believe, by Dr. W. G. Savage—that has received full support in our editorial columns.[1] The case for and against pasteurisation of milk has been argued at length in THE LANCET, and during the last few years we have published the reports on which its Manchester opponents chiefly relied. The arguments remain much the same when adapted to the circumstances of this particular locality. At present 75 per cent. of Manchester's milk is pasteurised, 5 per cent. is sterilised, and the remaining 20 per cent. is said to be raw. Prof. H. B. Maitland states [2] that of several hundred samples of unpasteurised milk tested in his laboratory during one year 14 per cent. contained living tubercle bacilli. It is estimated by the public health committee that 40 per cent. of the herds react to the tuberculin test and 2 per cent. of the milch cows have tuberculous udders. While eradication of tubercle from these herds is admitted to be the ideal it is considered impossible at present because of its enormous cost. Meanwhile, according to the chairman of the public health committee, there has been during the last five years an average of 289 cases of non-pulmonary tuberculosis among Manchester children annually, about half of which could be traced to bovine infection. Municipal expenditure, alone, in treating 130 cases for one year is put at £15,000 to £16,000. The answers given to such arguments were many. What is needed, the farmers say, is greater consumption of milk; children prefer it raw, and it is the small retailer of raw milk who keeps the price down. Fresh milk, moreover, is more nutritious, since pasteurisation precipitates calcium and destroys vitamins—a statement which may be read in the light of the Ministry of Health's considered pronouncement that pasteurisation, subject to careful operation and scientific control, "ensures a milk which not only is safe for consumption but also retains its food value practically unimpaired by the heat to which it is subjected." From a letter in the *Manchester Guardian* we learn that "if the Reading results [3] are a criterion of what would happen when everyone was fed on pasteurised milk, the race would soon die out." It was these same results, presumably, that were held to justify distribution of posters and leaflets saying: "Pasteurisation will kill your babies." As propaganda we should prefer the outburst of one of the aldermen, who insisted that people should be able to choose the kind of milk they prefer, and that it is an infringement of the public liberty to be forced to drink such milk as the corporation desires. But, after all, was there really any need for propaganda? As a critic of the farmers and their organisation pointed out, it seems possible that they were once more backing the wrong horse and protesting against their real interests. By opposing the proposals, he said, they appear to enlightened urban opinion as reactionary, which is far from wise at present; the alternative to pasteurisation would probably be a tightening-up of the administration of the Milk and Dairies Order, which would drive many of the smaller men out of milk production; and all this fuss is being made chiefly for the benefit of the producer retailer, who has always been the worst offender in undercutting prices.

If we dismiss the Manchester opposition lightly it is because on the whole the level of that opposition was low. Among the more reasonable criticisms of the scheme was the suggestion that the problem was national and should be treated nationally. But it was one of the merits of Dr. Savage's plan that it avoided the agonies arising from legislation which applies to the whole country, and that it correspondingly lightened inhibitory pressure on the small producer. Compulsory pasteurisation is not a complete and satisfactory solution of the milk problem, and its application anywhere must not be allowed to interfere with attempts to cleanse the milk-supply. At the same time, if rightly used, it offers a partial solution. The time is overripe for an English experiment comparable with the experiment of Toronto, where bovine tuberculosis has been practically abolished; and Manchester, with her record of leadership in public health, is a proper place for this important enterprise. We hope she will think again.

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Sir Thomas Horder, who was created baron at the New Year, has taken the title of Lord Horder of Ashford in the county of Southampton.

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## INDEX TO "THE LANCET," VOL. II., 1932

THE Index and Title-page to Vol. II., 1932, which was completed with the issue of Dec. 31st, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, London, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

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[1] THE LANCET, 1931, i., 1037.
[2] Reported in Manchester Guardian, Jan. 10th, p. 11.
[3] THE LANCET, 1931, i., 662.

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ROYAL NATIONAL ORTHOPÆDIC HOSPITAL.—A Post-graduate course in orthopædic surgery will be held at this hospital, 234, Great Portland-street, London, W.1, and Stanmore, Middlesex, from March 6th to 18th. Full particulars may be had from the hospital.

# SPECIAL ARTICLES

## CARBON MONOXIDE POISONING FROM MOTOR-CAR FUMES*

BY J. S. OWENS, M.D. DUB., A.M.INST.C.E., M.I.MECH.E.

SUPERINTENDENT OF OBSERVATIONS ON ATMOSPHERIC POLLUTION, DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH

PUBLIC attention for some time past has been directed towards the danger of poisoning from the carbon monoxide fumes emitted in motor-car exhaust gases. It is well known that carbon monoxide is an extremely poisonous gas, but there is still some difference of opinion as to whether a chronic form of carbon monoxide poisoning may not exist which has not yet been recognised as such.

Tables of permissible concentration of CO in air are available based on different authorities. For example, the following is from Yandell Henderson and H. W. Haggard [1]:—

| Concentration. | Carbon monoxide per cent. |
|---|---|
| Allowable for an exposure of several hours .. | 0·01 |
| Can be inhaled for one hour without appreciable effect.. .. .. .. .. | 0·04–0·05 |
| Causing a just appreciable effect after one hour's exposure .. .. .. .. | 0·06–0·07 |
| Causing unpleasant but not dangerous symptoms after one hour's exposure .. | 0·1 –0·12 |
| Dangerous for exposure of one hour .. .. | 0·15–0·20 |
| Fatal in exposure of less than one hour .. | 0·4 and above. |

Another method of approach, for which Prof. Henderson is responsible, takes into account the time of exposure as well as the other factors. He has evolved the following method of estimating the effects of CO concentration:—

If x is the number of units of CO per 10,000 of air,
t is the number of hours exposure,
c is a factor which is 1 for a man at rest and 2 for a pedestrian—
then if the product
ctx lies between 0 and 3, no ill effects are felt.
approaches 6, slight ill effects are felt.
" 9, headaches are produced.
" 15, danger to life is incurred.

It is probably true that smaller concentrations than those mentioned, if breathed for a sufficiently long period, would be injurious, and it is quite probable that many of the headaches from which people in closed cars suffer are due to the leakage of exhaust fumes to the inside of the car.

### ROAD TUNNELS AND GARAGES

Attention was first prominently drawn to the danger from exhaust fumes by an accident which occurred on May 10th, 1924, in the Liberty tunnel, Pittsburgh.[2] This is a tunnel 5889 ft. long, consisting of two tubes, 26 ft. wide at the floor and 20 ft. high, both lined with concrete, and straight. When the tunnels were constructed they were operated for about seven months without mechanical ventilation. Then an accident occurred which held up the vehicles in the tunnel, the CO concentration rapidly increased up to 25 parts in 10,000, and a number of people were partially asphyxiated. Shortly after this steps were taken to install mechanical ventilation of the "transverse" type, in which the inlet for fresh air is in a duct along the floor with lateral openings, while the exhaust is by a duct along the roof with similar lateral openings. This transverse method removes the impurity from a particular point of the tunnel without having to draw it along over any considerable length of tunnel as would be the case if it were ventilated from the end.

It was found that the average amount of carbon monoxide produced per minute per motor vehicle in this tunnel was about half a cubic foot, and it was concluded that an average pollution of 3 parts, with a maximum of 6 parts per 10,000, should not be exceeded. The transverse method of ventilation was fully developed for other American tunnels, and has been applied in the Holland vehicular tunnel under the Hudson. Here a standard of 4 parts per 10,000 was at first allowed, but it was subsequently reduced to 2½ parts per 10,000 for a period of five minutes. It is stated, in a paper [3] describing this tunnel, that experiments made on city streets showed a concentration in the open street up to 1·7 parts per 10,000 on still days.

The poisonous nature of the gases which collect in closed garages is now well known, and a number of people have lost their lives through remaining in closed garages with their car engines running. Experiments have been made in Washington at a large Government garage which showed that there was an average concentration of CO of 1 part per 10,000, rising sometimes to 8·9 parts. At another garage the average for a day was 1·64 parts per 10,000, and for an hour 4·33.[4]

### COMPOSITION OF EXHAUST GASES

In motor vehicles the fuel burnt is petrol or benzol, and these are composed practically entirely of carbon and hydrogen, with a negligible percentage of sulphur amounting to about 0·02 per cent. for petrol and 0·3 per cent. for benzol. Neglecting the sulphur, either petrol or benzol should burn to carbon dioxide and water, but in fact it is found that is not the case, and perfect combustion only occurs when the conditions are exactly right and the air-supply just correct in quantity. For example, with a little over 15 lb. of air supplied per lb. of petrol, the exhaust gases should contain nothing but $CO_2$, water, and nitrogen, but if the air-supply is reduced it is found that the percentage of carbon monoxide rises very rapidly.

*Table showing Composition of Exhaust Gases*
(A. W. Judge [5])

| Ratio of air to petrol by weight. | Per cent. composition. | | | | | | Percentage of heat of fuel used. |
|---|---|---|---|---|---|---|---|
| | $CO_2$ | O | CO | H | $CH_4$ | N | |
| 9 | 6·7 | 0 | 12 | 4·3 | 1·4 | 75·6 | 58 |
| 10 | 8·2 | 0 | 9·6 | 3·5 | 1·2 | 77·5 | 61 |
| 11 | 9·6 | 0 | 7·3 | 2·6 | 0·9 | 79·6 | 71 |
| 12 | 11·1 | 0 | 5·0 | 1·8 | 0·6 | 81·5 | 79 |
| 13 | 12·5 | 0 | 2·6 | 0·9 | 0·3 | 82·7 | 89 |
| 14 | 13·5 | 0·4 | 0·4 | 0·1 | 0 | 85·6 | 99 |

The accompanying Table shows the way in which the exhaust gases vary in composition as the air supply is varied.

We may take it that there is usually about 5 per

* Based on a paper read at the Public Health Congress and Exhibition in London, November, 1932.

[1] Noxious Gases. New York, 1927, p. 110.
[2] Engineering News Record, 1925, xciv., 764.
[3] Engineering News Record, 1928, ci., 942.
[4] Indust. and Eng. Chem., 1928, xx., 31.
[5] The Testing of High Speed Internal Combustion Engines, London, 1924.

cent. of carbon monoxide in the exhaust gases, and this makes them a very deadly poison unless rapidly diluted.

We have had some experience in England also in vehicular tunnel ventilation, and an investigation into the ventilation of the Blackwall and Rotherhithe tunnels has been made by Mr. C. J. Regan, and published in the L.C.C. Annual Report for 1930 (Part III., p. 271). In these tunnels the maximum permissible concentration of carbon monoxide was fixed at 2 parts in 10,000.

### CARBON MONOXIDE IN CITY STREETS

It is found that the air in busy city streets contains a measurable quantity of CO, averaging 0·8 parts per 10,000 in 14 towns of the U.S.A., about 0·5 in the street air in Chicago, and ranging from this to about 0·15 in suburban districts. Samples taken by Mr. Regan in central London, during the winter, gave 0·3 parts per 10,000. The concentration in the open street thus rarely approaches the danger limit, but it must not be forgotten that although a dangerous concentration may be rare, it does not follow that it never occurs.

In all cases of atmospheric pollution we have been accustomed to rely upon the scavenging action of the wind to clear away the impurities. This is the case with the smoke from our chimneys, grit and fumes from factories, as well as the fumes and poisonous gases permitted to escape from the exhausts of motor vehicles. Now it is true that there is usually some wind to carry these away; also that a concentration of vehicles at any particular place may not occur at the moment when the wind has failed. Again, we have the possibility of abnormalities in the vertical temperature gradient preventing the upward escape of fumes, but what we perhaps do not realise is that all the conditions favouring high concentration may some time occur together.

For example, a long street of high buildings may be crowded with motor vehicles owing to some hold-up of the traffic. This may happen on a day when the wind has fallen and when the temperature gradient overhead does not encourage the upward escape of hot gases. In such circumstances it appears possible that the concentration of poisonous gases might become sufficiently high to be dangerous. It was coincidence of certain conditions which brought about the accident in the Liberty tunnels.

The affinity of hæmoglobin for carbon monoxide is 300 times as great as for oxygen. Hence, in the presence of any particular concentration, the CO will be seized in preference to the oxygen, and the effect will be to produce a condition of the blood in which a definite saturation value of CO will be reached. It would seem, therefore, that however long the exposure to air containing carbon monoxide, the degree of saturation of the blood can never exceed a certain value corresponding to the concentration in the air. This does not, however, preclude the possibility that low concentrations of CO may be injurious when breathed for long periods.

Reference has been made to the use of heavy oil engines such as Diesel engines, and although these have not yet come into general use, there is a general tendency in that direction, and it is interesting to note that the exhaust from such heavy oil engines usually contains a very small proportion of carbon monoxide under normal running conditions, certainly much lower than that produced from petrol engines.

## THE EGYPTIAN LUNACY REPORT[1]

THE Lunacy Division Report for the year 1931, made to the Egyptian Ministry of the Interior and issued from the Public Health Department, reaches us a year later than the events which it chronicles. The report differs in certain respects—one, in particular, to which detailed attention must be drawn—from the reports previously issued. It is very brief, and brevity is no disadvantage unless it is obtained by the omission of matter pertaining to the subject. But it is a little surprising that the information from an important organisation, responsible for the treatment of 5262 cases in the year, and dealing with a resident insane population of 3227, should be considered to be adequately afforded in five and a half pages of text, consisting mostly of tabular statements. The shortness of the report has led to exclusion of the information formerly furnished as to the cost of new additional buildings and their maintenance; as to the number of seriously injured persons admitted; and as to the forms of insanity of the insane criminal patients; the religions and races of the admissions; their monthly distribution and occupations; the nationalities of the general paralytics, and the distribution of the pellagrins. No details of autopsies, or of the nature of the 17 accidents recorded are given.

It is stated that the death-rate calculated on the total number treated has risen from 5·5 in 1928 to 7·1 in 1931, a rise of 29 per cent. The value of the explanation suggested for this increase—viz., the feeble physical condition of some of the admissions—is discounted by the fact that the classification of admissions into "good," "poor," and "very bad," depends a good deal on the personal equation of the reporter, and this may vary with changing observers. The high death-rate among the chronic cases suggests defects in the nutritional value of the food, or some general factor which could affect all the inmates. A comparison of the death statistics of the year 1928 with those of 1931 shows that deaths from pulmonary diseases and tuberculosis rose from 40 in 1928 to 73 in 1931; from general paralysis, from 11 to 38; from pellagra, from 43 to 66; from senile decay, from 12 to 28; from kidney disease, from 18 to 40; from epilepsy, from 6 to 20 In all, these six categories account for an increase of 135 deaths The significance of some of these rises seem to deserve study. In comparing the death-rate of 1931 with that of previous years, the number of deaths of addicts should have been stated, and their figure deducted from the total number of deaths; a corresponding deduction should, of course, have been made from the total number under treatment; the death-rate of the insane, calculated on these reduced figures, would then have been comparable with that of previous years.

The reduction in the number of pellagrins admitted is worthy of note, the number having fallen from 189 in 1923 to 53 in 1931, a figure actually less than the number of deaths from pellagra during the year 1931 (66). It would be of great interest to know whether there has been noticed a corresponding diminution in the prevalence of pellagra in Egypt generally. If so, can the reason be found in any change in the diet of the fellaheen, perhaps in an increased consumption of wheat instead of maize?

The most outstanding event of the year, in the

[1] Lunacy Division Report, including the Mental Hospitals of Abbâssîya and Khanka and Khanka Criminal Asylum. Cairo: Government Press. 1932. P.T.8.

opinion of the Director of Lunacy, is that the Khanka Mental Hospital has been so divided that one portion forms a criminal asylum for men, and one for ordinary cases of lunacy, a decision being made at the mental hospital of Abbâssîya as to the mental state of criminals. To find room for all these cases at Khanka must be difficult, but in the following paragraph of the report we find that "it was decided to admit drug addicts on their own personal request, even to the extent of overcrowding the hospitals," and that "Khanka should take all the non-paying cases." This we think to be a far more outstanding event. It was emphasised in the report for 1930 that the mental hospitals were already overcrowded to the extent of 344 patients, on an average, beyond the number of beds existing; while 1113 patients had been discharged still insane during that year owing to lack of room It was further stated in that report that this discharge of the insane was "a very disturbing proposition." The disturbance must be aggravated if a decision is taken in the following year to admit a large number of persons not certified to be insane, but merely the subjects of vicious habits. Cases of real insanity from drugs continued, of course, to be certified and properly admitted, to the number of 52; but nearly 500 persons of vicious drug habits were admitted, while, consequently, an equivalent number of insane persons must have been denied the treatment which they would otherwise have had, and for which the hospitals were instituted.

No information is given as to the nature of the drugs used by these addicts, whether it was hasheesh, cocaine, morphia, heroin, or some combination of them. But the nature of the procedure will be better realised if we can imagine 20,000 habitual drunkards being admitted as voluntary patients into the already full county and borough mental hospitals of England in a year, and an equal number of insane patients discharged to make room for them. The admission of these addicts to the necessary exclusion of the insane who require hospital treatment is a retrograde measure, and appears also to be a fiasco, for the report states: "It is regretted that the experiment in so far as curing addiction is concerned is a failure, the effects of over-indulgence in drugs can be cured easily, but the cause of the addiction remains uncured, except in the extremely small class of accidental addiction. Drug addiction depends on the moral sense and strength of will of the individual, and cannot be improved in a few months, much less in the time taken to cure the ill-effects of the over-dosing. It is feared that the only radical cure for addiction is to improve the moral sense of the individual. In the meantime, the only hope is to make access to drugs very difficult, and their possession as unpleasant as possible." It would be of interest to know where the responsibility lies for the decision to admit drug addicts into the mental hospitals, for the lunacy authorities could hardly have welcomed the proposal. The admission of these addicts into the ordinary hospitals of the Public Health Department, or into special isolation camps would have been reasonable, or into prison infirmaries, when the individuals could have been charged with trafficking in prohibited drugs; but why send them to institutions already notoriously crowded, and intended for quite a different class of cases?

A study of the figures suggests that the intermingling of drug addicts with the insane has produced confusion in the figures recorded, as indeed it may well have done in the hospitals themselves. Thus the 492 addicts appear in some tables but, quite unaccountably, not in others—e.g., they swell the admission figure in Table I. to an unprecedented height (2225), and the number of recoveries has risen from 119 in 1930 to 490 in 1931. This reckoning of addict discharges as recoveries renders the figures shown valueless as an indication of the recovery rate among the Egyptian insane. In Table V. the inclusion of the addicts increases by 492 the figure credited to one of the causes of insanity in that table—viz., drugs. This table already (and rightly) included 52 cases of real insanity due to drugs. Yet in Table III. (Forms of Insanity) and Table IV. (Distribution of Admissions in the Country) the 492 addicts do not figure, being now apparently considered not to be suffering from insanity. This apparently arbitrary use of the figures relating to addicts wants explanation. If they appear in one table why not in all? In Table III., which professes to show the form of insanity of each person admitted, the total number of persons is given as 1556—i.e., the 2048 persons mentioned in Table I. less the 492 addicts; but, according to Table I., 80 or nearly 80 of these 1556 persons were not insane, and should have been so entered in Table III., while only the balance of 1476 persons should figure in Table III. under the ten forms of insanity mentioned in it. These 80 sane persons also figure in Table V., and the causes of their insanity (or sanity?) are professed to be given; perhaps chiefly among the 77 cases of unknown causation. These 80 sane persons also appear inappropriately in Table IV. Of course, they should not have appeared in any of these three tables.

It would have been wiser to have kept the statistics as to drug addicts completely separate from those relating to the ordinary insane. But, in view of the failure of the experiment in their admission to the mental hospitals, it is to be hoped that the procedure will be discontinued. The local lunacy authorities could make strong representations on the subject, and in so doing could rest assured that their fellow-workers in British mental hospitals would sympathise with their efforts to change an unfortunate policy.

The reduction of the report to its present size renders it difficult to form an adequate picture of the progress of lunacy work in Egypt, a matter of real regret. It is to be hoped that the lunacy authorities in Egypt will persuade the Government to remove any restraint that may have been exercised out of misplaced economy.

## MEDICINE AND THE LAW

### Patient Waives Professional Secrecy

THE stipendiary magistrate on Jan. 10th resumed the hearing at Burslem of the affiliation proceedings in which a doctor declined to give evidence at the request of a patient. The defendant denied paternity, said the girl's story was untrue, and called the doctor (who had treated him at a clinic under the Stoke-on-Trent public health department) in support of his statement. The doctor based his refusal on grounds of public policy. The magistrate, in adjourning the case in order to give the doctor a chance of considering the position, pointed out that the privilege of secrecy was not vested in the doctor but in the patient. A patient who wished his doctor to disclose something was entitled to have the benefit of the doctor's evidence. On resumption of the proceedings, the magistrate said the doctor had now supplied certain information in writing. It happened that, by a

misapprehension for which the doctor was in no way responsible, the information given was not the information required. The court therefore made a further adjournment in order that the doctor might give additional information whereby the credibility of a witness in the case might be tested.

Medical practitioners in charge of clinics may have occasion to emphasise the assurance of professional secrecy in order to persuade patients to present themselves for treatment with confidence, and to continue the treatment for the necessary period. In these circumstances, the practitioner will naturally deprecate and resent being placed in the witness-box and asked to disclose the facts of treatment. It looks like a breach of faith towards the patients in general, many of whom may know that he has given such evidence, but may not know that he gave it at the express request of a patient. Legally, the Burslem magistrate's view was undoubtedly correct. The privilege of secrecy belongs to the patient; the patient can waive it. The Burslem case differed only in degree from the ordinary occasions when a patient asks his medical attendant to give evidence of his injuries in support of a claim for workmen's compensation or for damages against a negligent motorist. Patients would be at a serious disadvantage if they could not claim this aid. The privilege of professional secrecy between solicitor and client is far more firmly established than that between doctor and patient. A solicitor is never compelled by a court to disclose his client's confidences. Yet he often goes into the witness-box to state facts in his client's favour.

### Inquest on Christian Scientist

A recent inquest on a Christian Scientist at West Norwood was on familiar lines. Medical evidence showed that the patient had advanced heart disease of long standing and was almost gasping for breath; she would still be alive if a doctor had been called in in good time. A Christian Science practitioner explained his method of treatment, and was asked the usual question as to how he would treat a broken leg. He said he had practised for 20 years; he took fees, and he professed to cure all ailments. The husband of the deceased explained her objection to the calling in of a medical practitioner. The jury added a strong rider condemning the denial of the benefit of modern medical science.

These cases have little medico-legal interest. Parliament has recognised Christian Science treatment by saving words in the Nursing Homes Registration Act; it is impossible therefore to suggest that the treatment and its consequences are illegal. The law stops far short of applying the principles relating to "suicide pacts" to cases where husband and wife agree to follow the rules of Christian Science.

## SCOTLAND

(FROM OUR OWN CORRESPONDENT)

#### PSYCHIATRY IN EDINBURGH

Dr. D. K. Henderson, who succeeds Prof. George Robertson in the chair of psychiatry as well as at the Royal Mental Hospital, gave his inaugural address on Jan. 12th. The chair owes its establishment largely to the late Sir Thomas Clouston and the late Prof. Robertson, who made psychiatry a reality in the University and in the Jordanburn Clinical Laboratory. Edinburgh is now peculiarly well-equipped over the whole field of mental diseases and mental deficiency. The superintendent of Bangour Mental Hospital, which is now under the municipality, is also the superintendent of Gogarburn institution, which has been designed for the early medical and hospital treatment of the insanities as well as for the care of the feeble-minded. He is, further, head of the service for the management of mental defectives in the special schools of the city, under the medical officer of health.

Prof. Henderson thus comes to the University, or rather back to it, to find a well-organised system for dealing with mental disorders in all their phases. In his lecture he showed a comprehensive grasp both of concrete detail and of broad principles, and also a sympathy with all varieties of treatment when kept in their proper place and perspective. One had to remember, he said, the many popular lines of interest for those "who faltered by the wayside and who still found their satisfaction and help in simpler beliefs." The influence of the mind in therapeutics was as powerful to-day as in the past centuries. The work of the psychiatrist concerned itself with the primal instinctive, impulsive, emotional needs of our being, with the instinct of flight and the emotion of fear and rage, with repulsion and disgust, with interest and wonder, with self-abasement, and self-assertion, with instinct of reproduction, the herd instinct, and with everything that determined the type of people we were. "That was too big an affair to be left to chance and the pious hope that everything would work out for the best in this best of all possible worlds."

"Here, in the present," he said, "we must build a psychiatric organisation, so that persons suffering from nervous and mental illness might obtain skilled help at a time when they were susceptible of betterment. The enthusiasm and initiative of his predecessor, Prof. Robertson, provided such an organisation for Edinburgh, and it would be his endeavour to keep the machinery in good working order."

#### THE ROWETT INSTITUTE

Through the generosity of Lord Strathcona and other friends, the Rowett Institute, at Aberdeen, has been presented with "Strathcona House," for the accommodation of research workers, who from time to time come from all parts of the Empire. The new hostel contains a large dining hall panelled in oak, a common-room in oak, and 15 bed-sitting rooms, in addition to kitchen and other essentials. Lord Strathcona presided at an inaugural dinner. The meeting included representatives from leading Government departments, research institutes, and, generally, from those concerned in the problems of animal and human nutrition. Sir Godfrey Collins, Secretary of State for Scotland, said that the influence of the institute had reached to all parts of the British Commonwealth. Sir William Hardy, F.R.S., Mr. F. L. McDougall, Sir Walter Fletcher, F.R.S., and Major Walter Elliot, Minister of Agriculture, also took part. The director of the institute is Dr. John Orr, F.R.S.

## PARIS

(FROM OUR OWN CORRESPONDENT)

#### MORE DISCIPLINE WITHIN THE MEDICAL PROFESSION

It is more or less a coincidence that both France and Belgium are at present trying to put their houses in order in the matter of medical discipline. Neither country has hitherto enjoyed the alleged benefits conferred on the doctors in England by the General Medical Council. Of course there has all the time been

the law of the land from the impartial constraint of which the medical profession has enjoyed no special immunity. For example, the French doctor who omits to take the necessary measures in a case of notifiable disease, and whose omission has certain deplorable consequences, may find himself suffering certain legal penalties. If his excursions in the operative field lead to disaster for the patient, they may ultimately lead to disaster for the surgeon himself in the law courts. But for a long time there has been a growing feeling in both countries that the sins of omission and commission in the practice of medicine are so specialised that none but doctors themselves possess the necessary knowledge for dealing with them. We set a thief to catch a thief, and the ex-poacher is the best gamekeeper; though far be it from me to suggest that the knowledge your General Medical Council brings to bear on disciplinary cases has been acquired by any personal experience. In Belgium there has been some opposition on the part of the medical profession to the principle of a medical court or council. But when, last December, a Bill embodying this principle was put before the French Chamber of Deputies, it was passed without discussion. This Bill provides for a Medical Corporation or Order, which, though in a sense autonomous, is to be a State-sanctioned body. In every department there is to be a separate Order, each with its own president and council. Every doctor who is not in the army, navy, or air force must join one of these Orders, and he cannot belong to more than one. Presumably there will be some sort of central body coördinating the activities of all the Departmental Orders. Their functions are to be manifold, from administering benevolent funds to investigating and dealing with cases of alleged infamous conduct in a professional respect. The French legal profession has already had a considerable experience of the disciplinary workings of a similar body, the constitution of which has, to a certain extent, been a model for the framing of the new medical Order.

### PYREXIAL THERAPY IN EXPERIMENTAL SYPHILIS

C. Richet and J. Dublineau have reported to the Academy of Medicine on some experiments with syphilitic rabbits submitted to a high temperature alone or in conjunction with some chemotherapeutic drug. By artificially raising the temperature of a rabbit for 22 minutes to 41·4° C., or for 15 to 17 minutes to 42·4° C., they succeeded in curing the syphilis in three cases, while they failed in two other cases. They ascertained whether a given rabbit was cured or not by injecting some of its tissues into a series of healthy rabbits and noting the results. In four cases the temperature of syphilitic rabbits was artificially raised at the same time that an infra-curative dose of arsenic was given. In every case the syphilis was cured. Investigations in vitro also showed that a temperature of 41° C. maintained for 30 minutes or longer robbed the treponema of all its virulence, though limited movements might continue two hours longer. It should be noted that Levaditi and many others have also contributed to the study of thermo-therapy in experimental syphilis.

### TREATMENT OF CANCER OF THE CERVIX

At a recent meeting of the Société Nationale de Chirurgie, Prof. Jean-Louis Faure weighed the claims of operative treatment against those of radium treatment in cancer of the cervix, and cited statistics in favour of the former. Among the last 200 cases of cancer of the cervix observed in his hospital, there were 171 pavement-celled cancers and 29 cylindrical-celled cancers—i.e., 14·5 per cent. of the latter. Now, according to Prof. Regaud, this latter class is radium-resistant. If his opinion is correct—and it is not unequivocally confirmed by the observations of Gosset and Wallon—then some 15 per cent. of all cases must be considered as hopeless if operative interference is abandoned. Another objection to radium treatment is its immediate mortality which, according to various statistics, ranges from 2 to 7 per cent. As for the late effects of radium treatment, the recent researches of Proust, published last October, are most disquieting. In 1926 he was able to show that 40 per cent. of his patients treated by radium could be considered as cured after an observation period of one to four years. But in 1932 only 10 per cent. still survived. The actual number of patients treated in the period 1922–1925, inclusive, was 236, and the survivors in 1932 numbered only 24. Prof. Faure remarked incidentally that in judging of the durability of the results achieved by the two methods of treatment, a longer observation period must be required of radium than of operative treatment. The patient who has been operated on and has remained symptom-free for two years, has nine chances out of ten of being permanently cured. But it may be necessary to wait five or even ten years before the permanency of a radium cure can be claimed. For the inoperable case radium may be admirable, but for the operable case it is, in his opinion, inferior to operative treatment.

# PANEL AND CONTRACT PRACTICE

## Treatment of Hospital Staffs

A RECENT appeal concerned the arrangements for medical treatment of hospital staffs. It has been customary in a certain hospital in London for the senior assistant medical officer to attend to the medical requirements of the staff. Dr. A, who held this appointment, refused from the beginning to undertake national health insurance work, mainly, it seems, because of his conscientious objection to issue certificates disclosing particulars of his patients' ailments. In 1913 Dr. Z, the medical superintendent of the hospital, joined the medical list; a large number of the insured members of the staff placed themselves on Dr. Z's list; the capitation fees which Dr. Z receives he places to a fund for the benefit of the staff. The insured members do not usually apply to Dr. Z for treatment; they are treated by Dr. A. In fact Dr. A does Dr. Z's work, but Dr. Z makes no personal profit from the arrangement. Dr. A, however, declines to issue certificates in the prescribed form required by approved societies; his certificates merely state that the insured person is "off duty owing to ill-health." This economy of information seems to have caused remarkably little administrative difficulty; the absence of the proper certificate has not prevented the insured persons from obtaining sickness benefit. But in one specific case an approved society complained to the Ministry that they "tried to obtain a proper certificate but the doctor who signs it objects to giving any other." The London insurance committee decided that Dr. Z had failed to comply with the terms of service. On appeal he argued that his duties under the medical benefit regulations do not arise until patients apply for treatment; he declared that

he was always ready and willing to give treatment and to issue certificates when asked by a patient to do so. The insurance committee's representative sought to argue that Dr. Z had failed to comply with the terms of service even though he had not committed a breach of the terms. The report on the appeal rejects this subtle distinction. It agrees with Dr. Z that his obligation to give treatment does not begin till the patient asks for it; it holds that there has been no breach of the terms of service. The report, however, does not overlook the omission to give certificates in the prescribed form. It observes that it seems to have been suggested that it did not matter whether the certificates tendered by insured persons to an approved society were in the proper form or not, or whether they did or did not contain the required information. It recalls the fact that the forms are the outcome of consultation and agreement and that they have been accepted by insurance practitioners generally, from 1914 onwards, as conveying information which it is important for the societies to have and not unreasonable for panel doctors to give. Although societies do in fact accept certificates not on official forms, the report regards the arrangement at this hospital as placing the insured persons on Dr. Z's list in an unfortunate position. Such an arrangement, "though not necessarily inconsistent with the requirements of the terms of service, obviously does not conform to that spirit of reasonable coöperation between insurance practitioners and approved societies which we are glad to think generally prevails." The Minister has allowed Dr. Z's appeal; he directs that no order be made as to costs.

### A Compassionate Arrangement

The Minister has allowed another practitioner's appeal in a case turning upon the extent to which a panel doctor may delegate work to an assistant. A doctor carrying on panel practice in south-east London died in 1928 leaving several young children. The two eldest were studying medicine but, not being yet qualified, were not available to succeed to their father's practice. By a compassionate arrangement designed to bridge the interval which must elapse before the children became qualified, an elderly practitioner, a friend of the family, undertook the practice himself. He changed his surname by deed poll to that of the deceased; he joined the London panel list, and put up his plate at the deceased's surgery. In 1929 he asked the London insurance committee's permission to employ an assistant. Leave was granted for 12 months on the applicant's assurance that he meant to attend the surgery daily himself, mornings and evenings. In 1930 the decision was reviewed. It was found that the assistant had signed every prescription for an insured person during the previous year. There was a question of the panel practitioner's fitness, but the panel committee declared him to be mentally and physically fit for his work in spite of his 80 years. From this point he did sign some of the panel prescriptions, but the large majority were still signed by the assistant. In 1932 the insurance committee took up afresh the question of withdrawing consent to the assistant's employment. The panel committee was of opinion that the practice and the insured person's interests had not suffered and that it would be unreasonable to withhold consent; the assistant did not want to become a partner; if he could not be employed the practice would suffer because a fresh practitioner would have to be brought in. The insurance committee nevertheless withdrew consent and the panel doctor thereupon appealed to the Minister. Among the witnesses at the hearing was Dr. Batteson, chairman of the London panel. He thought this was not a case of farming-out; there were no branch surgeries; one doctor was not exploiting another, and there was no prejudice to the interests of other practitioners; the appellant seemed to exercise a reasonable supervision. The persons appointed by the Minister to hear the appeal accepted and confirmed this evidence. There was proper continuity of treatment and there was no failure to comply with requests for personal attendance. If the insurance committee had refused permission after experience of the first 12 months of the arrangement, their decision could hardly have been held unreasonable. But now the position was admittedly better; the practice was satisfactorily conducted; the appellant himself was apparently taking a slightly more active part; and the deceased doctor's two children were on the point of being qualified. It was true that the insurance system must be embarrassed if all the treatment is given by a practitioner who is not the person in direct contractual relation with the insurance committee and responsible for mistakes which occur. But it was not possible to define exactly the extent to which a principal must personally participate in a practice. The Minister allowed the appeal but made no order as to costs. In this and the previous successful appeal, the London and Counties Medical Protection Society conducted the appellant's case.

### Publicity and Prejudice

Cases have occurred in various parts of the country in which, either through local gossip or publicity of the facts locally in a sparsely medically populated area, it has been easy to indentify the doctor if not the complainant (through the veneer of Dr. A or Mrs. R) in the report of a medical service subcommittee to the insurance committee. The same applies to the parties to a pharmaceutical service case. The members of the main committee, on the other hand, do not know the names of the individuals concerned when they discuss the report and its suggested recommendations. An insurance committee has no power to alter the findings of fact set out in these service reports, but it can amend the recommendations based on the findings, alter a caution to a censure, increase the sum of money suggested to be withheld, or decide to ask the Ministry to hold an inquiry as to whether the continuance of Dr. A on the panel is prejudicial to the efficiency of the service. The insurance committee thus has serious powers over and above those of its statutory subcommittee, and it is on this account the more important that its members should read the reports and agenda papers with an open mind before coming to a decision. And herein lies the difficulty, for agenda papers of the insurance committee may be circulated to the press before they reach the Ministry of Health, and it has happened on more than one occasion that some paragraph prejudicial to one of the parties concerned in the case—probably the doctor—has appeared in a local paper of an area in which the doctor is well known and recognisable by the facts stated.

In such conditions it is not likely that justice will be done, and the Ministry of Health, after consulting with the Insurance Acts Committee, has circulated a letter to insurance committees in which the opinion is expressed that no publicity should be given to any report of a service subcommittee before the

decision of the insurance committee on this report has been taken. The matter was discussed at some length by the general purposes subcommittee of the London insurance committee after obtaining the opinion of both its service subcommittees. The medical service subcommittee thought the view of the Ministry was right; the pharmaceutical service subcommittee thought it was wrong. The former would like its reports issued as a separate document to members of the insurance committee, but not to the press. The latter said it was an established custom amongst local authorities to send the agenda paper of any of their meetings to the press at the same time as it was circulated to members, and was unaware of any reason for withholding from the press such information as was contained in its reports.

It seems that in Lancashire the press are requested to refrain from publishing or commenting upon any matters contained in the reports of the service subcommittees until confirmed or altered by the insurance committee. This was the first course advised at the meeting of the London general purposes subcommittee. After discussion, however, a majority of the subcommittee thought there should, in London, be no alterations of the present procedure, as it would be contrary to the public interest for the press not to be furnished with agenda papers at the same time as to the committee. A resolution to follow Lancashire's example was withdrawn, and at its next meeting the subcommittee decided to take no action on the suggestion that reports of the service subcommittee should not be issued to the press till after such reports had been considered by main committee and decision taken thereon. This resolution when it reached the insurance committee was carried without discussion.

The Ministry of Health may make the suggested alteration obligatory on insurance committees. Their letter hints at this, although it does not say so. It is obviously impossible to have one set of rules for the trial of an insurance doctor acting in one area and another set of rules in another area.

# THE DOCTOR'S DAY

"Come, tell me how you live," I cried,
"And what it is you do!"

## XI.—TUBERCULOSIS OFFICER

I DO nothing else but tuberculosis, day in day out, being a purely "specialist" officer attached to the health department of a large county borough, and I am clinically absolutely "on my own." When one has been in the tuberculosis service for nearly 20 years and is known to do nothing else, it is natural that one's colleagues in general practice in the town should refer their suspect and actual cases of tuberculosis to him who, by virtue of training, experience, and qualifications, may justly lay claim to the title of specialist in this disease. I am happy in the thought that my relations with all the doctors here are most cordial. It might be thought that such work must be unsatisfying and monotonous, but, indeed, it is actually far from being so. True, I sometimes feel that I am fighting against odds, but a pessimist should never become a tuberculosis officer, for even with modern weapons of warfare consumption still remains, if not the "captain," at least the "lieutenant" of the "men of death." I am far more sorry for my nurses in my tuberculosis wards, who are daily and hourly in close contact with more or less advanced cases of the disease—and who are bigger grumblers than consumptives?—than for myself.

### ROUTINE

Here is an example of a day's routine work. On this particular morning I have my artificial pneumothorax clinic at the municipal hospital, which is some miles outside the borough boundary. I drive out by car, and the patients get there by bus or by train. At 10 A.M. screening begins, and the first case comes in. He is a man of 26, whose artificial pneumothorax was induced at one of the London hospitals, but he has recently come to live in this town, so I have to carry on with his refills. He has a fairly good right-sided collapse, the left showing merely the usual slight congestive hyperæmia; heart in good position. He subsequently took 300 c.cm. of air, and was left with a final pressure of $2 \pm 0$. The next was a girl of 19, whose artificial pneumothorax was of a years' duration. She had recently had a chill, some pain in the side, and had had a temperature of 100° F. On the screen the right chest was seen to contain fluid giving the characteristic wave-like movement on shaking the body, but not a very large quantity. She was told to go home and rest and return in a week for rescreening. Subsequently the fluid increased so that I had to replace it with air, and her progress was good. It is strange how well many of these artificial pneumothorax cases do after having had an effusion, provided of course that it is not purulent. The next was the case of a man of 50, tall, asthmatic, with a tendency to stoop, and a worried look. I should not have been surprised if I had found radiographic evidences of tuberculosis, but the screening showed nothing definite. A film revealed some slight mottling at the left mid-zone, but his sputum has been negative on several occasions. Here is a youth of 19 with a bad family history, his father and one brother having had the disease. He had felt "run down"—an ominous expression which I never like to hear—for some few months past, and owned to have smoked about 20 cigarettes a day. Physical examination showed nothing definite, but I thought it imperative to X ray him, as it not infrequently happens that a film will reveal something suggestive of an early lesion when one can hear practically nothing with the stethoscope. However, the film showed nothing upon which I should have been justified in labelling him as tuberculous. Nevertheless, his doctor and myself will both watch him, and if necessary I shall rescreen him and take another film. This young lady looks the picture of health, is symptom-free, though 12 months ago she was sputum-positive. She went away to a sanatorium where an artificial pneumothorax was induced, and now she has a good uniform collapse, free from adhesions, which are the twin bugbear with fluid of all artificial pneumothorax work, and I gave her a (three-weekly interval) refill of 350 c.cm. Take it on the whole it is perfectly true, as one of my colleagues once wrote in *Tubercle*, that an artificial pneumothorax out-patient clinic is mostly a happy crowd, because each patient feels that the special treatment is really getting to grips with the disease, and also because, in the favourable cases, the sufferers are feeling well and are at work. One of my boys is a butcher in full work, another a labourer also (luckily) in permanent work. It is always sad when, as occasionally happens, one has to abandon the treatment owing to adhesions, or to the spread of disease in the opposite lung. Still it is agreed that artificial pneumothorax is the brightest spot in our modern therapy, and, personally, I enjoy this part of my work more than any other.

The screening over, the refills are given, men first and women afterwards, and in the work I am most ably assisted by one of the assistant medical officers of the hospital who is capable of acting for me in my absence. In practically all cases the patients are able to return home immediately after a refill. Only exceptionally is a little rest needed, and then it is generally owing to some threatened or actual

complication, or to some temporary upset, such as indigestion.

I am fortunate in having beds of my own to look after, but as it happens these are nearly all semi- or greatly-advanced cases, some of which are received into the tuberculosis wards of our infectious diseases hospital within the borough, but others are housed in the municipal hospital already referred to. Emergency cases, such as that of a domestic servant with hæmoptysis, whose mistress desires her speedy removal to an institution, are taken into whichever hospital has a vacancy. Early cases we send away to sanatoria in various parts of the country, and cases of surgical tuberculosis in children and adults we send away to those hospitals specially dealing with such cases.

### THE DISPENSARY

My dispensary is centrally placed and is readily accessible from all parts of the town. There are five clinics weekly, on three afternoons and two evenings, and every effort is made to enable the place to act as it is rightly intended to do under the tuberculosis scheme—namely, as a place for consultation and sorting out of cases—a clearing-house, in fact—not as an out-patient department for the perfunctory distribution of cod-liver oil and malt. I do not say that we do not give medicines to uninsured persons, but this is discouraged, patients being referred to their own medical attendant whenever possible.

After lunch I start at 2 P.M., the premises having been opened and gas-fires lit (in winter) by the dispensary nurse. Nearly all the cases come with a doctor's card or letter, which means a letter back to the sender with an expression of opinion and suggestions as to treatment, &c. The patient is first interviewed singly by the nurse who acts as a clerk, the necessary details being entered by her upon the blank dossier. She next weighs the patient, directs him or her into a dressing-room, and, if a female, comes into my consulting-room with her. The first patient to-day is a thin, under-nourished little girl of 7, recommended by one of the school medical officers. She is stated by her mother to have had a cough on and off for about two years, usually worse in the winter. The tonsils and adenoids had been removed a year ago. She had no temperature and there was no family history of tuberculosis. On examination there was nothing definite to be heard, and I could not even say that d'Espine's sign was positive. There were no visible or palpable glands. She may, of course, have an enlarged mediastinal gland which is pressing on the trachea, giving rise to the cough, but this can only be determined by an X-ray examination, which I propose to do. The next is a boy of 9, with a tag of exuberant granulations at the end of a scar on the side of his neck. The history was that a swollen gland had appeared in that region during the summer holidays, had burst, apparently without medical attention, and had left the usual ugly, broken-down, partially healed scar. He was referred to his own doctor.

The next is a problem, a tuberculous mother, with three small children, and a drunken husband who has also been mental—truly a case for the eugenists to shout over! At various times the family has been assisted by every humanitarian agency, both official and non-official, in the town with only temporary benefit. She has been sputum-positive and the whole family has been examined as contacts with negative result. One child, the eldest, was sent away by one agency to a boarding-school near London, but the father demanded her return; another was got into a children's home in the town, but the third refuses to leave his mother, and the parents continue to lead a cat-and-dog sort of existence—a pitiable state of affairs in which law and medicine seem able to do little. The next is a young woman in whom thoracoplasty has been performed for empyema, six years ago, with a very good result. She has been able to do a certain amount of domestic work in her mother's house, though there are still a few crepitations at the upper part of the affected lung. She looks very well, and is certainly a marvel considering what she has been through.

Here is a thin man, a war-pensioner, who had a four-figure position before the war. He has a slight cough, very scanty sputum which has been positive, but suffers from great fatigue on the slightest exertion. He is in a fairly comfortable position in life, living with relatives, and can take as much rest as is demanded, so he is really well off and does not need institutional treatment. Rather different is the case of this young man of 20, also thin and weedy, with a cough, night-sweats, and slight sputum of about two months' duration. He does not consider himself ill at all, nor does his father, but I had to tell the latter that there were early signs of disease at one apex, and that if this were allowed to go on without treatment matters would only get worse. His doctor and I agreed that sanatorium treatment was strongly indicated, and arrangements were made to get him away as soon as possible.

The next case, a woman of 19, the daughter of a tuberculous mother, whom she helped to nurse, revealed the sad fact that she herself had become a victim of the disease, but she was a home-loving girl and she did not wish to leave her mother. Besides, she had a good bedroom to herself and there was no evidence of privation. On examination I found a few crepitations at the right apex and the sputum was positive. There was slight evening pyrexia and also loss of weight. Her doctor, to whom I wrote about her condition, agreed with me that the only practical thing to do was to induce an artificial pneumothorax upon the affected side, provided that the other lung was good. I screened her a few days later and took a film, and as the left lung appeared to be healthy I took her into the hospital and induced an artificial pneumothorax with success. Several old cases followed, and after the clinic was over I went to the laboratory at our infectious diseases hospital, where I examine all the sputa of my own patients as well as specimens sent up by practitioners in the town, and stained several films.

### CONTACT EXAMINATIONS

It may be urged that I have said nothing yet about the preventive aspect of my work, for surely that is equally, if not more, important than the treatment of those already affected. Well, suffice it to say that our staff of health visitors, my dispensary nurse, and myself do all in our power, by visitation and persuasion, to get contacts medically examined, either in their own homes or at the dispensary. In many cases the request is acceded to quite readily, but in others it seems that no amount of talking, even of the right kind, will induce some to be examined who undoubtedly should be. They plead all manner of excuses and some are most elusive, so that the ideal "march past" of possible and actual contacts, originally a regular slogan of the early days of the tuberculosis campaign, becomes a downright hunt, and even then the prey will not be tracked down. In all open cases it is imperative to get hold of young children whose susceptibility to "mass infection" is great. It is in cases of this kind that an after-care committee can be of great service, and I am fortunate in having one in this town, to which I am the honorary medical adviser. We are often successful in getting children from tuberculous households sent away to convalescent homes, or to be boarded out with some kind motherly person in the country. With some persons of an obstinate nature it is little use to adopt a bullying or a frightening attitude. It may take longer, but one is often more likely to win a case over for examination by a plainly reasoned statement about the manner in which infection is conveyed and avoided. To assist further in this direction we make free use of leaflets giving simple talks about consumption, what to do when one has got it, and how to prevent giving it to others as well as how to prevent people from becoming infected. It is found that personal talks in the home and at the dispensary, by the health

visitors and by myself, are better than set lectures or the display of cinema films, for at the latter one finds only the converted attend, and it is well known that cinema proprietors do not find such propaganda films at all profitable.

### THE INTEREST OF THE WORK

By way of compensation for any distasteful portion of the work of a tuberculosis officer there is its variety, for any clinic will provide plenty of material of interest, and so far as treatment or research are concerned I have entire liberty to do what I like, and since I have charge of beds I can admit my own cases and watch the effect of a given remedy. I see, too, a large number of non-tuberculous conditions—e.g., morbus cordis, neurasthenia, anæmia, bronchiectasis, bronchial asthma—so that it cannot be said that the work is wanting in clinical interest. Then, too, there is always the pleasure of seeing a really early case respond to prompt treatment.

From the public health aspect one cannot but lament the present economic stress and unemployment resulting in overcrowding and a chronic state of malnutrition, especially among children. The improvement that takes place with better housing and feeding is a sufficient indication of the main lines upon which legislation, hand in hand with philanthropy, will be found to be of practical service in the way of prevention in the future. To be able to render help to the practitioner, as well as to the patient, in a personal consultation at the bedside is another of my pleasures, and here again one feels, whether in confirming an already expressed opinion or in pronouncing judgment in a diagnosis, that it is worth while to be a specialist in the work instead of having it tacked on, so to speak, to a post in which one has to do schools, maternity work, infant welfare, and all the other sundries that go to make the work of a combined medical officer a glorious mixture of activities.

I have omitted to mention one thing which all my colleagues in the tuberculosis service deplore—namely, the large amount of clerical work, form writing, and the making of numerous returns to one's own as well as outside authorities, which has to be done. From various considerations it is not always possible to employ adequate clerical assistance, but it does seem to detract from the work when one has, as I have, to enter a name and address, in the case of a new patient, at least three times and sometimes more. To many medical men and women, not specially gifted with the mathematical mind, the filling up of the annual returns is nothing more nor less than a nightmare, but no doubt it is regarded as a pleasure by some.

Enough has been said to give some idea, I trust, of the daily work and routine of a tuberculosis officer, but let no one take up such an appointment unless he or she be a confirmed optimist.

# PUBLIC HEALTH SERVICES

## Influenza

THE spread of influenza over the country is taking the course rendered familiar by previous winter epidemics, leaving room for doubt and uncertainty as to whether this or that locality will suffer sooner or more than others. Taking the 118 great towns as a whole, a sharp rise in reported deaths from influenza was apparent in the return for the week ended Dec. 10th, 1932, the figures [for successive weeks from Dec. 3rd on being 33, 68, 85, 120, 303, 681, and 1041. In London no indication of unusual incidence was seen until the week ended Dec. 31st, the figures for deaths from influenza for the last four weeks being 8, 25, 93, and 242. The epidemic began in the north; Glasgow reported 86 deaths already in the week ended Dec. 24th; Newcastle-on-Tyne, Liverpool, and Manchester suffered early, and are now through the worst. In Birmingham the epidemic started quite suddenly about 12 days before Christmas, when 10 per cent. of the employees of utility services were disabled; the maximum was reached shortly after Christmas, and the decline was rapid. There, as elsewhere, the epidemic was described as relatively mild, the incidence of pneumonia being quite small. Up to the week ended Dec. 31st the actual deaths from acute pneumonia in London were below those to be expected from the ten-year median value; in the following week London was 11 per cent. above expectations, England and Wales 60 per cent. above. In London the influenza has taken two familiar types, alimentary and respiratory, and, as mentioned in a clinical note on p. 141, the features of these two types have remained sharply distinct. Many hospitals in London and large centres have passed through anxious times owing to the numbers of the nursing staff down with influenza at the same time, but no serious results have been reported. Judging by reports, the west country has so far escaped, with the exception of Exeter.

## INFECTIOUS DISEASE

### IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 7TH, 1933

*Notifications.*—The following cases of infectious disease were notified during the week:—Small-pox, 16 (last week 19); scarlet fever, 1802; diphtheria, 870; enteric fever, 21; acute pneumonia (primary or influenzal), 2816; puerperal fever, 37; puerperal pyrexia, 132; cerebro-spinal fever, 38; acute poliomyelitis, 9; acute polio-encephalitis, 2; encephalitis lethargica, 7; dysentery, 5; ophthalmia neonatorum, 72. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 10th–11th was as follows:—Small-pox, 52 under treatment, 7 under observation (last week 75 and 2 respectively); scarlet fever, 1790; diphtheria, 1678; enteric fever, 12; measles, 267; whooping-cough, 491; puerperal fever, 31 (plus 13 babies); encephalitis lethargica, 230; poliomyelitis, 3; "other diseases," 286. At St. Margaret's Hospital there were 15 babies (plus 7 mothers) with ophthalmia neonatorum.

*Deaths.*—In 117 great towns, including London, there was no death from small-pox, 3 (1) from enteric fever, 25 (0) from measles, 12 (1) from scarlet fever, 34 (8) from whooping-cough, 40 (9) from diphtheria, 37 (8) from diarrhœa and enteritis under two years, and 681 (93) from influenza. The figures in parentheses are those for London itself.

Fatal cases of influenza were reported from 88 great towns outside London, the largest number of deaths being 163 at Birmingham, 45 at Newcastle-upon-Tyne, 24 at Sunderland, 23 at Liverpool, 22 at Manchester, 19 at Portsmouth, 14 at Leeds, 13 at Southampton, 12 each at Gateshead and Worcester. The fatal cases of enteric fever occurred at Wigan and Worcester. Measles caused 8 deaths at Birmingham, 4 at Leicester, 3 each at Gateshead and Liverpool. Diphtheria was credited with 4 deaths at Bootle, 3 at Leeds. In the same week Glasgow reported only 36 deaths from influenza, and 13 from whooping-cough.

The number of stillbirths notified during the week was 267 (corresponding to a rate of 39 per 1000 total births), including 50 in London.

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COLDSTREAM COTTAGE HOSPITAL.—Last year there were 155 in-patients, an increase of 35, and their average stay rose from 19½ to nearly 24 days. There were 60 major operations.

# CORRESPONDENCE

## MASKED HYPERTHYROIDISM

*To the Editor of* THE LANCET

SIR,—Dr. John Towers, in his paper (p. 67), and you, in a leading article (p. 91), have called attention to an important aspect of hyperthyroidism as a cause of heart disease. I believe that I was one of the earlier writers in this country to describe this particular aspect of thyroid disorder, and in a paper [1] recording two cases I referred to the article (quoted by Dr. Towers) by S. A. Levine and C. C. Sturgess, a reprint of which reached me soon after these cases had been under my care. In one of my cases the patient complained of the heat of the ward (in winter), and I have subsequently found the preference of such people for cold weather a useful indication of raised metabolism. I venture to quote the concluding paragraph of my article as evidence of my agreement with Dr. Towers's observations:

"This type of hyperthyroidism is a subtle one, a most important one, and one the true nature of which is often overlooked. Suspect hyperthyroidism in all cases of fibrillation, tachycardia, and other cardiovascular disorders for which no other cause can be found and which do not respond to the usual remedies, and be fairly convinced of the accuracy of your diagnosis if only one or two of the many symptoms of hyperthyroidism are present."

I am, Sir, yours faithfully,

Norwich, Jan. 14th, 1933. H. J. STARLING.

## DERMATITIS FROM DYED FABRICS

*To the Editor of* THE LANCET

SIR,—The valuable paper by Dr. E. M. Killick and Dr. J. T. Ingram in your issue of Jan. 14th (p. 77) calls for some comment, because it may tend to confuse the issue as between chemical and personal tests. The authors, as it seems to me, go beyond their brief, and would have one or the other as a causa causans of dermatitis resulting from the wearing of dyed garments. Personally, I have always employed both chemical tests on the garment and specific tests on the individual for idiosyncrasy. I am therefore well aware that idiosyncrasy plays an important part. The point, however, is this: There are certain methods of dyeing in which soluble oxidation products—e.g., of para- or meta-phenylenediamine are produced which are capable of giving rise to dermatitis in healthy controls. These can be withdrawn from fur—and I assume from other garments also—by prolonged washing. This is an expensive process and has frequently been omitted in the case of furs which have given rise to dermatitis. I have produced dermatitis by patch and scarification tests with these substances not only with the incriminated fur, but with the chemicals prepared in vitro. I have never, however, attempted to deny, nor so far as I can ascertain has anyone else, that idiosyncrasy to fabrics dyed with phenylenediamine or any other chemical does not occur. In many of my own cases I found such idiosyncrasy, and therefore absolved the fur.

The point is of something more than academic value. The fur trade is to be congratulated on having solved the problem of providing for persons of limited means garments which keep them warm and give them a pride in their personal appearance: and for this purpose para-phenylenediamine and its allies are customarily employed. The soluble intermediate oxidation products, however, are harmful and capable of causing dermatitis in subjects from whom idiosyncrasy is absent and failure to eliminate these has been judged in many legal causes to be evidence of negligence, and damages, often large, have been awarded because fur dermatitis may last for months or even years and reduce the sufferer to a wreck from constant irritation and sleeplessness.

To sum up. There are two causes for "fabric" dermatitis—namely chemicals which give rise to irritation of the skin in healthy controls, and which should have been removed from the fabric, and sensitisation which is attributable to the person and not the garment. The distinction is not difficult, for appropriate and reliable tests are available for the purpose. Whether the garment is made of fur or other fabric does not seem to matter very much.

I am, Sir, yours faithfully,

A. KNYVETT GORDON, M.B.

Bedford-square, W.C., Jan. 16th, 1933.

[1] Clin. Jour., Feb. 8th and 15th, 1928.

## PROGRESSIVE POST-OPERATIVE GANGRENE OF THE SKIN

*To the Editor of* THE LANCET

SIR,—It was most interesting to read Mr. F. Hector Scotson's report of a case in your last issue, as the condition is more common than references to the literature would lead one to suppose. The reasons are doubtless due to the obscurity of the cause and the lack of success from treatment.

In my experience gangrene of the skin may follow an operation, usually for appendicitis, or it may occur spontaneously, and then most frequently in the genito-crural region. The appendix is most often a gangrenous one in the process of which the *Bacillus morgan*, a derivative of the *B. proteus vulgaris*, plays a rôle. A case of the spontaneous form, unique, because of the multiplicity of the lesions, was described in *The Nature of Disease Journal* (p. 120). The cause appears to be the *Bacillus gangrenæ cutis*, a name, which I believe was first given by Milian in Paris to the bacillus held to be responsible for the spontaneously occurring genito-crural form. Balog published one of these genital cases in 1931. The *B. gangrenæ cutis* belongs to the proteus group of micro-organisms, and has most probably had origin with Ducrey's bacillus from the *B. morgan*. There is a close similarity between the gangrenous lesion and ulcus molle serpiginosum, of which I published the first description in this country in 1914. The most successful treatment for gangrene of the skin is novarsenobenzene, injected intravenously. The drug is almost a specific and does away with all need for the cautery. The drug best suited for ulcus molle serpiginosum is tartar emetic injected intravenously.

I am, Sir, yours faithfully,

J. E. R. MCDONAGH.

Wimpole-street, W., Jan. 13th, 1933.

## DOSAGE OF INSULIN

*To the Editor of* THE LANCET

SIR,—May I, as another "diabetic doctor" on insulin for ten years, present a more fortunate experience of the successful standardisation of British insulin than is expressed by my colleague in his letter published to-day. In 1923 and 1924, the early days of insulin, I gave clear evidence from

clinical tests on myself and a few patients, that variations of 60 per cent. from batch to batch of both English and American insulin were not uncommon. This was immediately taken up by the Medical Research Council and the manufacturers, and a biological test on animals was worked out which narrowed the variations to under 10 per cent., which is the smallest variation that I can detect by the most careful work on diabetics. Since then I have always been on the lookout for changes in new batches. I use only two makes of insulin; between 1926 and 1929 there were three bad batches. Since then I have noticed no variation in them. Whenever a reliable patient suspects the uniformity of any new batch, as not infrequently happens, I always test it out, and the evidence usually shows the patient, and not the insulin, to be wrong. In patients on the most careful diet, insulin requirements often vary by more than 10 per cent. from day to day, depending on natural changes in foods (as you point out), and in activity and general health.

I know that the reliability of British insulin has always been recognised in Europe, and it is pleasing to note in foreign protocols how often it is used in accurate experimental work instead of the insulin produced in that country. I am a little surprised to gather that my colleague has so many unfortunate experiences with different batches of insulin, because, if he reserves, as he says, a whole batch for his personal use, that might be expected to be an adequate supply for some 50 years.

I am Sir, yours faithfully,

Harley-street, W., Jan. 14th, 1933. R. D. LAWRENCE.

## "DISEASES OF THE BLOOD"

*To the Editor of* THE LANCET

SIR,—I have read with much interest the review of the second edition of my book "Diseases of the Blood," in your issue of Jan. 7th (p. 26). I was particularly charmed to see your reviewer's statement that "Misstatements of facts . . . are unfortunate"; I presume that no one could deny this, but it is especially unfortunate when such misstatements appear in a review. I am accused of having omitted reference to the value of iron in post-hæmorrhagic anæmia, but reference to the index of my book shows an entry "Iron, after hæmorrhage, 41." On this page I indicate the need for iron in cases of acute post-hæmorrhagic anæmia, and on the next page, in connexion with chronic post-hæmorrhagic anæmia, I assert that the medicinal treatment is the same as in the acute form. I also refer to the value of whole liver and of certain special forms of liver extract; a cross reference to p. 179 indicates the paragraph in which the essential characters of such an extract are described.

With reference to the anæmia of infancy. Your reviewer appears to contend that, because the red corpuscles rise after administration of iron, the anæmia is necessarily due purely to a deficiency of that metal; it may be so, but I doubt it, and do not feel that the controversy has been much advanced by his pontifical statement. I think that if he had read the book with more care he would have found that cases of acholuric jaundice with practically no splenomegaly are mentioned; equally, there is reference to the almost completely normal character of the blood during remissions.

I am unrepentant about my statement that "We are completely ignorant as to the mechanism by which the number of leucocytes in the circulation is regulated," but, of course, am well aware of the fact that nucleotide is capable of altering the number of the white cells in the blood. I plead guilty to the slip concerning phospholipin in the typical cells of Gaucher's disease, but do not feel that this is of much importance "in a book which will appeal to the general practitioner."

I should be very glad to hear the comments of your reviewer on my alleged "misstatements of facts."

I am, Sir, yours faithfully,

A. PINEY.

Pathological Department, The Cancer Hospital, Fulham-road, London, S.W., Jan. 11th, 1933.

*** We should be loth to agree with Dr. Piney that scientific accuracy is not of much importance in a book intended for the general practitioner; we feel he should be given clear indications of treatment in common conditions. In post-hæmorrhagic anæmias iron and whole liver in large doses are of proved therapeutic value. Dr. Piney does briefly mention that iron should be given—we frankly admit the oversight—but he gives no indication of the extreme importance of adequate and persistent dosage, nor of the uselessness of certain of the preparations on the market. In acholuric jaundice he states that the blood always shows some deficiency of hæmoglobin and corpuscles, although Gansslen has reported a large group of cases with no anæmia. The fragility of the red cells does not invariably decrease after operation, it may indeed increase. Hyaline degeneration of the pulp arterioles, described as a common histological feature of the spleen in this disease, occurs in so many conditions as to be hardly characteristic of any one disease. The work of Doan and his collaborators on the control of circulating white cells merits discussion, even if Dr. Piney is unconvinced as to its interpretation; readers may be glad to turn to the admirable summary of the position in *Jour. Amer. Med. Assoc.*, 1932, xcix., 194.—ED. L.

## CONTRACEPTIVES

*To the Editor of* THE LANCET

SIR,—It is not generally realised that at least 175 chemical contraceptives may be found upon the market. Many of these appear to depart markedly from the desired standards laid down by the leading workers in this field, and a similar state is to be found when mechanical methods are considered. It is for this reason that several firms have formed themselves into a group with the following objects in view: (1) to maintain a certain standard of purity and excellence in manufacture; (2) to focus attention upon such methods as are likely to meet with general success and to see that they are harmless to the user, easy to apply, and reasonable in cost; (3) to study the question of packing and deterioration and the issuing of seemly literature and advertising.

This group is the direct result of the museum which I have recently formed in the department of public health of the London School of Hygiene and Tropical Medicine where the many aspects of this difficult and multi-sided subject are dealt with. The formation of a similar group in the United States and on the continent is under consideration, and I submit that this is a most important step which not only will help to remove the stigmas which have so long existed, but may well aid contraception to become a worthy branch of preventive medicine.

I am, Sir, yours faithfully,

CECIL I. B. VOGE.

London School of Hygiene and Tropical Medicine, Keppel-street, W.C., Jan. 13th, 1933.

## GASTROSTOMY VERSUS INTUBATION

*To the Editor of* THE LANCET

SIR,—In his interesting letter Mr. E. Watson-Williams states as one of the disadvantages of gastrostomy :—

> Food is not taken by the natural channel, and is *not tasted*. The psychic effect, when the patient realises that he will never taste or swallow anything again, is often very bad. (Italics mine.)

During my hospital practice I tried to overcome this difficulty by the following method: When feeding by gastrostomy I always put in the patient's mouth one or two table-spoons of the food from the syringe, asked him to chew it properly and slowly, and then to spit it out with the saliva. I was brought to this simple method by the remark of one of our patients who was being given minced veal, "What a pity I cannot taste the meat; I like it so much." The patients were always very pleased and sometimes asked for some more spoonfuls.

I am, Sir, yours faithfuly,

Masaryk University Anthropological Institute, Czechoslovakia, Jan. 9th, 1933. V. SUK.

## PAIN AND THE DOCTOR

*To the Editor of* THE LANCET

SIR,—Prof. Robertson often asserted that "all pain is mental," and those who practise his branch of medicine mostly agree with that dictum. If that is accepted, how does it work in with the various statements as they appear in an article in your issue for the 14th inst. under the above heading? Are not such statements very much on a line with the statement often heard from a nurse in reply to a doctor's inquiry—viz., "he has no temperature."

Is it not as futile to expect to avoid pain as it is to expect to avoid a temperature?

I am, Sir, yours faithfully,

Hove, Jan. 16th, 1933. E. ROWLAND FOTHERGILL.

## NEW PREPARATIONS

*To the Editor of* THE LANCET

SIR,—Under this heading in your issue of Dec. 24th last (p. 1416) the statement is made that Essogen is ten times U.S. cod-liver oil strength. The official U.S.P. standard for cod-liver oil is that it should contain 50 curative doses for rats per gramme—i.e., the effective rat unit is 20 mg. Admittedly this standard is a very low one—much lower than the minimum blue value of 6 specified in the new issue of the British Pharmacopœia. Exact comparison is impossible because of the weaknesses of the test specified by the U.S.P., but Essogen on the basis of blue value is more than 300 times the B.P. standard, and therefore must be of even higher relative potency as compared with the U.S.P. standard.

We are, Sir, yours faithfully,

LEVER BROTHERS, LIMITED.

Biological Laboratories, Port Sunlight, Cheshire, Jan. 12th, 1933.

## VENOUS STAGNATION FROM GRAVITY

*To the Editor of* THE LANCET

SIR,—In his article on Phlebitis in THE LANCET of Jan. 14th, Mr. A. Dickson Wright mentions stagnation in the veins, due to rest in bed and cessation of muscular contractions, as a contributory factor. The following movement which can be made periodically by the patient is important for prophylaxis. The patient should lie or recline with his foot against a firm surface, such as a bolster or a bed-table up-ended with a pair of legs under the mattress. The big toe and heel are then applied to this surface, arching up the dorsum of the foot by means of the intrinsic muscles, and the back of the knee is pressed down against the mattress. There should be a slight extension of the hip-joint, and the patient should not press back his head and shoulders but should momentarily increase the pressure between the lumbar region and the mattress.

During this very mild activity a large proportion of the muscles in the limb are in use. Apart from the prime-movers the following muscles coöperate: those whose tendons cross the ankle-joint, muscles in the thigh and buttocks, also those in the lower abdominal wall. An adequate pumping effect on the venous system occurs throughout the limb with a minimum expenditure of energy. The psychological effect of getting the feet against a firm surface, and of doing something to shorten convalescence, encourages the patient to make periodically this small effort.

I am, Sir, yours faithfully,

London, Jan. 13th, 1933. JAMES K. MCCONNEL.

# THE SERVICES

### ROYAL NAVAL MEDICAL SERVICE

The following Surg. Lts. (D.) to be Surg. Lt.-Comdrs. (D.): S. Mawer, L. F. Fairey, L. A. Moules, and G. Baker.

F. W. Chippindale to be Surg. Lt.

The following appts. are notified: Surg. Lt.-Comdrs. W. Flynn to *President* for course and to *President* for Experimental Stn., Porton; R. L. G. Proctor to *Vernon* and A. G. L. Brown to *Despatch*.

Surg. Capts. H. E. E. Stephens to *Victory*, for Haslar Hospital; and F. J. Gowans and A. G. V. French to *Egmont*, for *Maine* and R.N. Hospital, Malta, respectively.

Surg. Comdrs. F. H. Vey to *Pembroke*, for Chatham Dockyard; and F. E. Fitzmaurice to *Leander*, on commg.

Surg. Lts. M. G. Ross to *Glorious*; M. J. Brosnan to *Vivid*, for Devonport Barracks; A. S. Cox to *Valiant*; and T. L. Cleve to *Maine*.

### ROYAL NAVAL VOLUNTEER RESERVE

Surg. Capt. R. J. Willan is placed on the retd. list.

Surg. Lt. F. W. Chippindale, Commission terminated on transfer to R.N.

Surg. Lt. R. H. Berry is apptd. to *Victory*, for Haslar Hospital.

### TERRITORIAL ARMY

Lt. J. V. Morris to be Capt.

### INDIAN MEDICAL SERVICE

Lts. (on prob.) Sangham Lal and B. L. Taneja to be Capts. (prov.) (on prob.).

ACCIDENT CASES AT RATE-AIDED HOSPITALS.—At a recent health committee meeting of the Essex county council it was reported that certain insurance companies had refused to meet claims made upon them under Section 36 (2) of the Road Traffic Act, 1930, in connexion with accident cases admitted to the committee's institutions, on the grounds that the Section did not apply to rate-aided hospitals. From counsel's opinion, since obtained, it would appear that the committee has a right of recourse to the insurance companies for a payment up to £25 in each case where it can be proved that liability attaches to a company under a policy, and when the person concerned or his relatives are unable to meet the cost of maintenance. The committee has therefore instructed its collectors in all cases where the cost of maintenance cannot be obtained from the patient themselves to apply again to the insurance companies involved. If satisfaction cannot be obtained, the committee intends to settle the matter by bringing a test case in the High Court.

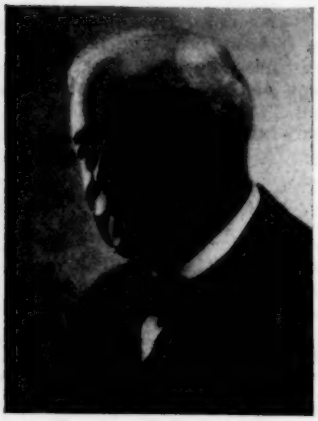
# OBITUARY

## SIR ROBERT JONES, Bt., Ch.M. Liverp., F.R.C.S. Eng.

LATE ADVISER IN ORTHOPÆDIC SURGERY, THE MINISTRY OF PENSIONS, AND INSPECTOR OF MILITARY ORTHOPÆDICS, A.M.S.

WE regret to record the death of the great orthopædic surgeon, Sir Robert Jones, which occurred on Saturday last, Jan. 14th, at Bodynfod Hall, Llanfechan, the house of his son-in-law. The medical profession has lost in him the most prominent British figure in orthopædics, and for his services to the wounded in the war the country owes him an unpayable debt.

Robert Jones was born at Rhyl in 1858 the son of a father bearing the same name; his mother was Miss Mary Hughes, member of a neighbouring family. Privately educated, he received his medical training at the Universities of Edinburgh and Liverpool, and qualified in 1878 as M.R.C.S., proceeding later to the fellowship of the Edinburgh College of Surgeons. He received at the outset of his professional career the impetus which led later to his distinguished position. He worked as apprentice to his uncle, Hugh Owen Thomas, the inventor of the Thomas's splint, who was the son of a famous and skilful bone-setter; so all that the unqualified manipulator had to teach was known from the start of his career to Robert Jones, who, moreover, always acknowledged his debt to this traditional and empiric learning. He commenced practice in Liverpool, and after holding some junior appointments quickly obtained a place first on the staff of the Stanley Hospital, and later on that of the Royal Southern Hospital.



SIR ROBERT JONES

[*Photograph by Brooke-Hughes*

It was some time before his unusual grasp of the principles and his ready inventiveness in the treatment of orthopædic cases were perceived outside his own centre. His fellow orthopædists, however, soon came to regard him as a pioneer, recognising the practical nature of much of his original technique, and his skill alike in diagnosing the conditions and suggesting the course of treatment to be adopted. In those early days America and the continent knew Robert Jones better than did his own country. It was not so much by innovations that he attracted attention as by his skilful application of the old knowledge to meet the advance of general therapeutics. An increasing familiarity among medical men with the problems presented by the deformities and distortions following hereditary conditions or disabilities acquired in childhood called for developments in orthopædic work that had hitherto been unthought of; Robert Jones did the thinking, and by speech, pen, and clinical example inspired many followers. Some years before the European War he was a member of French, German, Swedish, Italian, and American orthopædic societies, and when, in 1912, was invited to deliver the annual oration at the Medical Society of London he chose for his subject the surgical treatment of infantile paralysis, and threw powerful light upon the possibilities of effective treatment in many situations where surgical interference had appeared disappointing. His particular experience was gained in his wards at the Royal Liverpool County Hospital at Heswall, which owed its real inception, in 1909, to Robert Jones, and which is now amalgamated with the Liverpool Children's Infirmary. In 1913 he was president of the orthopædic section of the International Congress of Surgeons, held in London, and when the war broke out he had attained to such a position as to make him the ideal leader in the movement for the furnishing of organised orthopædic assistance to the wounded and injured in the war.

At the beginning of the war, when the wounded poured into this country as the result of great casualties and enforced retreats, all the British hospitals were soon full to overflowing, and auxiliary hospitals and command depôts became equally crowded. At the same time so large a proportion of surgeons were on service abroad that organisation for the treatment of this inrush of sufferers was well-nigh impossible to institute. This was Robert Jones's opportunity and magnificent use he made of it. The first task was to collect the cases most requiring attention. Investigation showed that in all the hospitals and depôts there were victims of ununited or badly united fractures, or of ankylosis, rendering function almost nugatory; cases, also, where badly devised operations had resulted in useless or flail joints, and cases of undiagnosed nerve lesions. In other cases operations had been well performed, but the appropriate after-treatment was wanting. In short, orthopædic surgery for the benefit of our soldiers was not being properly practised, and could not be properly carried out upon individual cases scattered all over the country by practitioners who did not claim to have any particular familiarity with the conditions to be met or the best methods of meeting them. It was then that the War Office decided that an effort should be made to segregate groups of cases into especially staffed and equipped centres, where continuity of treatment could be secured for such cases as injuries to peripheral nerves, ununited and malunited fractures, injuries to joints, and cases likely to result in deformities of the extremities. The first centre established was the hospital at Shepherd's Bush. Here Robert Jones started his great endeavour, aided by a band of enthusiastic assistants, many of them Americans, whose country had not yet espoused the cause of the Allies. The amount of good done was incalculable, and went on there and at the numerous other centres for many years, to the benefit of these men now pensioners or seeking to regain civilian employment. Indeed the development of orthopædic surgery under the urgent and tragic circumstance of the war became a striking feature in surgical science, expanding by rapidly increasing strides and coming to embrace a scope and range unthought of. The need for increased knowledge brought with it new theories and new practices based on pathological and physiological observation. Appliances for restoration of

function and for re-education were soon forthcoming, and it became clear—for the first time to many doctors as well as to the public—that orthopædic surgery was not a story of special splints or of remedying particular deformities, but covered the large range of surgery implied in the restoration of function to nerves and muscles in deformed or disabled limbs. Three years after the cessation of hostilities Robert Jones edited the "Orthopædic Surgery of Injuries," written by his own colleagues attached to the orthopædic centres, which later became the special military surgical hospitals, and in a modest preface outlined the activities of which he himself was a chief promoter. At these hospitals there were eventually no less than 30,000 beds, a figure which gives some idea of the magnitude of the activities inspired by and largely controlled by Robert Jones.

On his seventieth birthday a group of surgeons, friends, and colleagues of many nationalities entertained Robert Jones to dinner and presented him with the Robert Jones Birthday Volume, a collection of 25 original essays bearing in different directions on the specialty of orthopædics, and inspired by the work done in coöperation with or at the instigation of their guest. At this dinner Lord Moynihan, then President of the Royal College of Surgeons of England, delivered a short address on Robert Jones, describing him as prophet, high priest, and practitioner, and setting out his personal qualities in the words: "Robert Jones," said Lord Moynihan, "speaks ill of no man. He seeks and finds good in all things and in all men. He sets an ideal and a standard of action in friendship which all strive to reach when with him. In a long and very intimate friendship I have never heard an unjust criticism, a cruel jibe, or a word of bitter cynicism on his lips. He covers his displeasure or stern disapproval by silence, or a restrained reproof that is often weightier than a torrent of words from others. His personality radiates cheeriness, good temper, and goodwill. All men are attracted by him, and in war-time conflicting temperaments found in him something that appeased their differences, assuaged animosities, and encouraged a desire for friendliness. He was then called upon to rule in various places, over colleagues at first unfriendly, openly antagonistic, indifferent to his rule, or incredulous of his practice. We were all amazed at his success in overcoming very real difficulties by gentleness, sympathy, a true understanding of the minds of others, and a tactfulness which in times of crisis was almost magical." None of those who knew Robert Jones personally would wish to have a syllable altered in this estimate of his actions and of the spirit which inspired them.

The honours which fell upon him in recognition of the work done before, during, and after the war were numerous. He received a C.B. in 1917, and in the same year was knighted. Two years later he was appointed K.B.E., and in that year was elected to the Fellowship of the English and the Irish College of Surgeons, being given also the American Distinguished Service Order. The Universities of Wales, Aberdeen, Liverpool, Harvard, Smith, and Yale gave him honorary doctorates, and the American College of Surgeons elected him a Fellow. He was appointed Knight of Grace of St. John of Jerusalem and consulting orthopædic surgeon to St. Thomas's Hospital. In 1926 he received his well-earned baronetcy. Of all these honours bestowed by the State and by his profession, it can be truly said that he earned the distinctions and that his colleagues rejoiced in his reception of them.

Sir Robert Jones married Susie, daughter of Mr. William Evans, of Liverpool, who died in 1918, and by whom he had one son, and a daughter, the wife of Mr. Frederick Watson, of Bodynfod Hall, Montgomeryshire, a champion of the cause of crippled children, a partner in the publishing house of James Nisbet and Co., and a well-known author.

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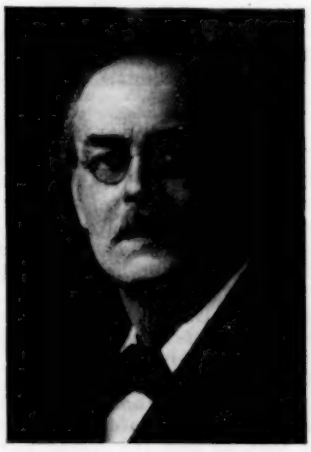
## RICHARD GILL, F.R.C.S. Eng.

Mr. Gill, who was for 35 years administrator of anæsthetics at St. Bartholomew's Hospital, and had been living in retirement since 1916, died at Shaftesbury on Jan 13th, after a short illness.

Born in 1856, Richard Gill gained the preliminary scientific exhibition at St. Bartholomew's Hospital in October, 1874. He went on to win most of the other scholarships open to him, and at the University of London took many honours in succession at the final B.Sc. in 1878, M.B. in 1879, and B.S. in 1880. He was admitted a Fellow of the Royal College of Surgeons of England in 1881, having passed the necessary examinations before he had attained the legal age of 25, and without presenting himself for the diploma of M.R.C.S. After being house physician at the Great Northern Hospital he became house surgeon to Sir William Savory at St. Bartholomew's Hospital, being the last to serve without an assistant house surgeon and to have a "take in" lasting a whole week. In 1881 he was appointed assistant chloroformist to Joseph Mills, the first whole-time anæsthetist to the hospital, succeeding him in 1893, when he was appointed chief chloroformist; the title of his appointment was soon changed to administrator of anæsthetics and demonstrator of anæsthetics in the medical school. He resigned both positions in 1916, when he was elected a governor of the hospital.



MR. GILL

*[Photograph by H. W. Barnett*

As an anæsthetist Richard Gill devoted his whole working life to St. Bartholomew's Hospital. He was an extremely fine administrator; it was an education in itself to see him give chloroform in a long and difficult abdominal operation. Requiring only a drop bottle and a small square of lint he would produce perfect anæsthesia and relaxation with a minimum quantity of the drug. He was equally successful with gas and ether administered with Clover's apparatus or by means of a small bag. As an anæsthetist he insisted that the patient should be watched carefully during the whole period of administration, and emphasised the necessity of considering him as an individual rather than as a machine to be kept in a state of insensibility. He practised the axiom

which he taught that automatic breathing is the true sign of anæsthesia. As a teacher he was excellent; as a lecturer he was difficult to follow and was unable to hold his audience, for his brain worked faster than his tongue. It happened from time to time when he was lecturing that he would pause, and after a longer or shorter interval would continue some sentences ahead of where he had stopped, leaving his hearers to fill up the gap for themselves. At the beginning of the war he was attached as anæsthetist to the First London General Hospital with the rank of Captain R.A.M.C. (T.), but found himself unable to adapt himself to military discipline.

A colleague writes: "In early life Gill had a remarkable power of assimilating facts which he could rapidly reproduce on paper, and he thus made an admirable examinee. Of this faculty he made little use in after life. He was wholly without ambition, and was content to lead the placid life of a philosopher when he might have enjoyed the stirring existence of a surgeon in the active practice of his profession. Averse from society, and somewhat of a recluse, he was but little known even to the men of his own generation. The few who knew him became his staunch friends, for they recognised his strict integrity and his entire absence of self-assertion."

Mr. Gill married Elizabeth Ann, daughter of John S. Bostock, M.R.C.S., who practised for many years at Horsham in Sussex. There were no children of the marriage.

### WILLIAM GALBRAITH, L.R.C.P. Edin.

A FINE record of public service ended with the death of Dr. William Galbraith, of Gosforth, Newcastle, on Jan. 6th, at the age of 87. Born at Ayr and educated at Ayr Academy, he qualified at Edinburgh in 1878. For 50 years he was in practice at Gosforth, and during that time held the appointments of medical officer of health, police surgeon, and public vaccinator. In this half century he initiated many public health improvements which were reflected in a decreasing death-rate, so much so that Gosforth was locally known as a health resort. As a physician he had a high reputation among his fellow practitioners as a quiet and remarkably correct diagnostician. He was a founder and the oldest member of the Gosforth Medical Association. A friend writes that "he was the true type of the ideal family doctor; to him the interests of his patients and profession were first and the business side last, frequently to his own personal loss. Naturally he was beloved and honoured by all of his patients, for whom he always had a cheery word; his healthy physique and smiling, ruddy face gave a cheering stimulus to everyone. His long life was fully occupied by his work and his sport—for he was more than usually an all-round sportsman. As a young man he was a good footballer and cricketer; for many years he was a member of the Northumberland cricket club and the city golf club. His prowess at bowls was noteworthy, and he toured many parts of Britain with local teams playing tournaments. His annual holiday was spent in shooting and fishing in Scotland." Dr. Galbraith is survived by two daughters. Dr. Nicol Galbraith, medical officer of health for South West Kent, is his nephew.

### THE LATE MR. CECIL BEADLES

Prof. G. Grey Turner writes: "Cecil Beadles was a wonderful fellow, though his accomplishments were only known to a comparatively small circle. For the past few years he demonstrated to me the new specimens which had been added to the College museum during the previous year—the annual show, as he called it. He knew every specimen and every detail of the history available and was always ready to add to the interest of our talk by referring to other specimens in the museum, or by deploring the lack of something he sorely wanted. His anxiety to add to the collection in spite of his failing health gives something of the Hunterian ring to the last letter I had from him.

"'I enjoyed going round the show with you,' he wrote, 'and am always pleased to see the interest you take in it. Have you any specimens you think of presenting for next year? If so, I should be glad to have them as soon as possible, as I want to push on as much as possible during the next month or two. *I fear being laid up in the winter months.* I already have a fair number in preparation for 1933: some quite good things. Amongst these are some gall-bladders from Cairns Forsyth, a finger with radium carcinoma from Cuthbert Wallace, a heart with extraordinary dilatation of coronary vein—but I won't anticipate further. By the by, have you any specimens of sarcoma of bowel you can give us? we are badly off for these.'

"In preparation work Beadles was truly a marvel, and the way he could decide exactly how to cut a specimen in order to bring out its best features was almost uncanny. Nowhere in the world can better specimens be found than those prepared and mounted by his own hands. But he was not only a morbid anatomist, for he always corrected his observations by microscopical investigation, and had very clear views on pathological problems in general."

## MEDICAL NEWS

### University of Cambridge

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY

The committee for medical radiology and electrology have approved the theses of the following candidates:—

Margaret A. Bromhall, J. S. Brown, G. T. Calthrop, E. N. Cook, E. R. Crisp, A. C. Devaraj, Nathaniel Fram, M. H. Hellman, R. F. Innes, J. N. Jacobson, S. A. Nagga, J. J. O'Grady, R. N. Perrott, F. G. Stewart, and E. R. Williams.

At recent examinations the following were successful:—

*Part I.*—J. S. Austin, L. R. B. Birt, L. G. Blair, Isedor Fine, F. C. Golding, Elizabeth M. Haworth, Robert McWhirter, W. W. Main, R. F. May, R. J. L. O'Donoghue, R. M. Patterson, R. F. Phillips, E. J. Rawnsley, William Sowerby, Elizabeth M. F. Taylor, A. R. Thomas, J. Z. Walker, and B. W. Windeyer.

### National University of Ireland

*University College, Cork.*—At recent examinations the following candidates were successful:—

M.D.

Myles McSwiney.

M.B., B.CH., AND B.A.O.

Charles Delea and J. J. O'Sullivan.

### Royal College of Surgeons of England

A quarterly meeting of the council was held on Jan. 12th, with Sir Holburt Waring, the president, in the chair. Resolutions of condolence were passed on the death of Mr. H. S. Clogg, chairman of the court of examiners, and of Mr. C. F. Beadles, pathological curator of the museum.

Diplomas were granted, jointly with the Royal College of Physicians, as follows:—

*Public Health.*—S. N. Bandyopadhya, W. D. T. Brunyate, Alice E. N. Gilby, A. W. Johns, Stephen Knight, Mohan Singh, M. M. Syddiq, L. D. Williams, and H. M. Willoughby.

*Tropical Medicine and Hygiene.*—Mabel G. Brodie, D. D. Karunaratna, C. K. Lakshmanan, and V. Nadarajah.

*Psychological Medicine.*—Sophia Antonovitch, G. G. Brown, Samuel Carden, H. W. D. Crook, J. L. Faull, B. M. C. Gilsenan, Kenneth Hazell, J. K. C. Liddell, J. R. Murray, F. E. Norris, T. P. Parr, Norman Rawstron, G. M. Smith, and G. V. Stephenson.

*Laryngology and Otology.*—Robert Evans, Leonard Jacobson, Joshua Mazell, H. C. Meathrel, K. V. B. Pillai, A. F. Quayle, Aaron Rakoff, Arnold Rose, B. K. Sheorey, M. R. Sheridan, and I. B. Thorburn.

*Medical Radiology.*—A. A. Digges la Touche and G. D. Steven.

Sir Cuthbert Wallace was appointed Hunterian orator for 1934. Mr. T. W. P. Lawrence was appointed acting

pathological curator. Prof. R. E. Kelly was re-elected a member of the court of the University of Liverpool for the ensuing three years. The Hallett prize for anatomy and physiology was awarded to Mr. S. G. Nardell, of King's College, London.

*Forthcoming lectures.*—The following lectures will be given on Mondays, Wednesdays, and Fridays during January and February: Jan. 23rd, Mr. Arthur Edmunds on unsuccessful appendicectomy; Jan. 25th, Mr. Harold Burrows on the induction of cancer in animals by pure chemical substances; Jan. 27th, Mr. W. E. M. Wardill on the principles of treatment of cleft palate; Jan. 30th, Mr. Kenneth Walker on per-urethral operations on the prostate; Feb. 1st, Mr. P. H. Mitchiner on the treatment of burns and scalds, with special reference to the use of tannic acid; Feb. 3rd, Mr. J. Paterson Ross on sympathectomy as an experiment in human physiology; Feb. 6th, Mr. H. P. Winsbury-White on the paths of infection between the genital organs and the urinary tract; Feb. 8th, Mr. Stanford Cade on radiation treatment of cancer of the mouth and pharynx; Feb. 10th, Mr. H. Jackson Burrows on tissue culture in its relationship to surgical pathology; Feb. 13th, Mr. P. N. B. Odgers on the anatomy of the lumbar and lumbo-sacral diarthroidal joints in man; Feb. 15th, Prof. R. J. S. McDowall on experimental shock, with special reference to anæsthesia; Feb. 17th, Mr. R. W. Raven on diverticula of the pharynx and œsophagus, with special reference to the morphological and embryological aspects; Feb. 20th, Mr. Laurence O'Shaughnessy on thoracic surgery—the factor of post-operative infection; Feb. 22nd, Mr. G. A. Mason on the surgical significance of the vitelline duct; Feb. 24th, Mr. E. R. Flint on pre-operative procedure. All the lectures will be given at the College at 5 P.M.

## University of London

Six lectures on the Physiology of the Nervous System in Man will be given at the Middlesex Hospital medical school, Mortimer-street, W., by Prof. Samson Wright, at 5 P.M. on Tuesdays and Thursdays from Feb. 7th to 23rd inclusive. No tickets are required.

At a meeting of the court on Jan. 11th, with Lord Macmillan, the chairman, presiding, it was announced that the Clothworkers' Company, the Grocers' Company, the Drapers' Company, and the Skinners' Company had each decided to make grants to the university in the shape of annual payments extending over a series of years. These grants will amount in all to £20,000 from the Clothworkers' Company, £10,000 from the Grocers' Company, £5000 from the Drapers' Company, and £5000 from the Skinners' Company. Like the grants already announced from the corporation of the City of London, from the Mercers' Company and from the Fishmongers' Company, these benefactions will be applied towards meeting the cost of the new ceremonial hall to be erected on the university's site in Bloomsbury.

## Society for Relief of Widows and Orphans of Medical Men

At a quarterly court of directors held on Jan. 4th, Dr. W. Culver James, the senior Vice-President, being in the chair, grants amounting to £1975 were voted for the half-yearly payments to the widows and orphans in receipt of relief. Of this amount, £112 10*s.* was for special grants to orphans to enable them to continue their education, or assist them in embarking on careers. The expenses of the quarter were £88 2*s.* 6*d.* In December last £640 was distributed as a Christmas present. There are now 52 widows and seven orphans in receipt of relief. Six new members were elected at the meeting, and two resignations were accepted. Membership is open to any registered medical practitioner who at the time of his election is residing within a 20-mile radius of Charing Cross. Application forms from the secretary of the society at 11, Chandos-street, London, W.1.

## Fellowship of Medicine and Post-Graduate Medical Association

Arrangements for next week will be found in our Medical Diary. A course in Dermatology will be given at St. John's Hospital from Jan. 30th to Feb. 25th, which will include clinical instruction daily, and lectures on Tuesdays and Thursdays. There will also be a course in gynæcology at the Chelsea Hospital from Feb. 6th to 18th (either morning or afternoon sessions may be attended); an all-day course in diseases of the chest at the Brompton Hospital from Feb. 6th to 11th; a course in antenatal treatment at the Royal Free Hospital from Feb. 3rd to March 11th on Fridays at 5 P.M.; and a week-end course in physical medicine at the London Clinic and Institute of Physical Medicine on Saturday, Feb. 11th, and Sunday the 12th. Courses, lectures, and demonstrations are open only to members and associates of the Fellowship of Medicine, and further particulars may be had from the secretary of the Fellowship at 1, Wimpole-street, London, W.1.

Sir James Dundas-Grant has been elected an honorary member of the Italian Society of Laryngology, Otology and Rhinology.

## Royal Aeronautical Society

On Thursday, Jan. 26th, at 6.30 P.M., Wing-Commander G. S. Marshall, M.R.C.S., is addressing this society on The Physiological Limitations of Flying. The lecture will be given in the hall of the Royal Society of Arts, 18, John-street, Adelphi, London, W.C.

## Post-Graduate Work in Newcastle

Four special courses have been arranged for the months of January, February, and March by the University of Durham. On Wednesdays at 4 P.M., beginning on Feb. 8th, there will be weekly lectures on diseases of infancy and childhood, either in the Babies' Hospital or in the Royal Victoria Infirmary, Newcastle. It is proposed that the course on diseases of the eye should meet at the Royal Victoria Infirmary on Mondays, beginning on Jan. 23rd, at 12.0 noon, but the time may be altered by agreement. Ten meetings will be held dealing with infectious diseases and tuberculosis at the City Hospital, Walker Gate, on Thursdays at 3.30 P.M., commencing on Jan. 19th. From Tuesday, Jan. 24th, there will be ten weekly demonstrations at 3 P.M. on diseases of the skin at the Royal Victoria Infirmary. Fees are charged for these courses, and application should be made to the registrar of the College of Medicine, Newcastle. Classes for clinical instruction in medicine and surgery will be held every Sunday morning at 10.30 from Jan. 22nd to March 26th, at the Newcastle General Hospital.

## Grants in Aid of Scientific Research

The Council of the British Medical Association announces that it is prepared to receive applications for research scholarships as follows: an Ernest Hart memorial scholarship, of the value of £200 per annum; a Walter Dixon scholarship, of the value of £200 per annum; and three research scholarships, each of the value of £150 per annum. These scholarships are given to candidates whom the Science Committee of the Association recommends as qualified to undertake research in any subject (including state medicine) relating to the causation, prevention, or treatment of disease. Each scholarship is tenable for one year, commencing on Oct. 1st, 1933. A scholar may be reappointed for not more than two additional terms, and is not necessarily required to devote the whole of his or her time to the work of research, but may hold university or other appointments, provided the duties do not interfere with his work.—Grants: The Council of the Association is also prepared to receive applications for grants for the assistance of research into the causation, treatment, or prevention of disease, when preference will be given to applicants who propose as subjects of investigation problems directly related to practical medicine. Applications for these scholarships and grants must be made not later than Saturday, May 20th, 1933, on a form, supplied on application to the Medical Secretary of the Association, B.M.A. House, Tavistock-square, London, W.C.1. They must be accompanied by the names of three referees, competent to speak as to the capacity of the applicant for the researches proposed.

## Medical Society of Individual Psychology

The annual dinner of this society was held on Jan. 12th at the Florence Restaurant, London, with Prof. W. Langdon Brown, the chairman, presiding. Dr. F. G. Crookshank, the hon. secretary, announced the result of elections for membership and associateship, bringing the list to 97, and the chairman, commenting on the increase from 9 in 1930 to 97 in 1933, proposed the election of Drs. Zilahi, Seif, and Alfred Adler as honorary members. This was carried with acclamation, and Prof. Langdon Brown, announcing the completion of the "century," suggested that Dr. Adler should be invited to become honorary president of the society. He then proceeded to give the toast of the society, remarking that sound critics had declared the outstanding medical event of 1932 to have been the progress made in the recognition of psychology as an integral part of medicine and a necessity to the study of the individual patient. This advance, he declared, was in great measure due to the work of the society. Dr. O. H. Woodcock gave the health of the guests, including Dr. Henry Devine, president of the section of psychiatry of the Royal Society of Medicine, and Dr. Graham Howe, president of the medical section of the British Psychological Society. Dr. Devine replied in a speech, emphasising the links between general medicine and psychology and psychiatry. Dr. Crookshank proposed the health of the chairman in terms expressive of the great gratitude felt by every member of the society for the invaluable help, guidance, and support afforded them by him during the last two years. Prof. Langdon Brown, in reply, declared his confidence in the assured future of the work of the society.

# Medical Diary

*Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.*

## SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Jan. 23rd.—8 P.M., ODONTOLOGY. Casual Communication. Mr. George T. Hankey: Von Recklinghausen's Disease, with Local Tumour of the Palate. Paper. Mr. J. Draper Cambrook: Some Observations on the Extraction of Teeth in Cases of Hæmophilia.

TUESDAY.—5 P.M., EPIDEMIOLOGY AND STATE MEDICINE; MEDICINE. Discussion: Undulant Fever. Openers: Dr. W. E. Hume (Newcastle), Sir Weldon Dalrymple-Champneys, Dr. I. Walker Hall (Bristol). Other speakers will follow.

WEDNESDAY.—5 P.M., COMPARATIVE MEDICINE. Discussion: Some Aspects of Anæsthesia in Animals. Opening papers: Mr. L. O'Shaughnessy: Anæsthesia in Chest Surgery. Mr. J. G. Wright: Nembutal Narcosis in the Dog and Cat. Members of the Section of Anæsthetics are specially invited to attend.

THURSDAY.—8.30 P.M., UROLOGY AND SURGERY. Discussion: Tuberculosis of the Male Genital Tract. Openers: Mr. Clifford Morson (Urology), Mr. A. E. Webb-Johnson (Surgery).

FRIDAY.—5 P.M., DISEASE IN CHILDREN. (Cases at 4.30 P.M.).

MEDICAL SOCIETY OF LONDON, Chandos-street, W.

MONDAY, Jan. 23rd.—8.30 P.M., Discussion on Anæsthesia during Labour to be introduced by Mr. Leslie W. H. Williams, Dr. Douglas Belfrage, and Dr. Glyn Hughes.

NORTH-WEST LONDON MEDICAL SOCIETY.

TUESDAY, Jan. 24th.—9 P.M. (at Willesden Constitutional Club House, Walm-lane, N.W.), Dame Louise McIlroy: Treatment of Complications of Labour and Puerperium.

MEDICO-LEGAL SOCIETY.

THURSDAY, Jan. 26th.—8.30 P.M. (at 11, Chandos-street, Cavendish-square, W.), Dr. Godfrey Carter: (1) An Unusual Case of Fractured Spine; (2) A Case of Prussic Acid Poisoning; to be followed by a discussion.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, 49, Leicester-square, W.C.

WEDNESDAY.—Jan. 25th.—5 P.M., continuation of his paper, Some Observations on Leprosy in Great Britain at the Present Time, by the President, Dr. J. M. H. MacLeod.

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

MONDAY, Jan. 23rd.—5 P.M., Mr. Arthur Edmunds: Unsuccessful Appendicectomy. (Hunterian lecture.)

WEDNESDAY.—5 P.M., Mr. Harold Burrows: Induction of Cancer in Animals by Pure Chemical Substances. (Hunterian lecture.)

FRIDAY.—5 P.M., Mr. W. E. M. Wardill: Principles of Treatment of Cleft Palate. (Hunterian lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Jan. 23rd to SATURDAY, Jan. 28th.—NATIONAL HEART HOSPITAL, Westmoreland-street, W. Special Post-graduate Course in Cardiology. All day. MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square. Tues., Lecture on Some Affections of the Skin in Childhood, Dr. Godfrey Bamber, at 4 P.M. (Free to Members and Associates.)—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Special Evening Demonstration of Diseases of Children. Thurs., at 8 P.M. Cases will be shown by the following Demonstrators: Dr. Leonard Findlay, Dr. D. W. Winnicott, and Mr. Rodney Maingot.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith-road, W.

MONDAY, Jan. 23rd.—10 A.M., Medical and Surgical Wards, Skin Out-patients. 2 P.M., Operations, Surgical Wards, Medical, Surgical, and Eye Out-patients. 4.15 P.M., Lecture, Dr. Grainger Stewart: Compression Paraplegia.

TUESDAY.—10 A.M., Medical Wards, Surgical Demonstration. 2 P.M., Medical, Surgical, and Throat Out-patients. 4.15 P.M., Lecture, Dr. Pritchard: Chronic Infections.

WEDNESDAY.—10 A.M., Medical Wards, Children's Medical Out-patients. 2 P.M., Medical, Surgical, and Eye Out-patients. 4.45 P.M., Venereal Disease.

THURSDAY.—10 A.M., Neurological Out-patients, Fracture Demonstration. 2 P.M., Operations, Medical, Surgical, Genito-urinary, and Eye Out-patients. 4.15 P.M., Lecture, Mr. Batchelor: Hernia.

FRIDAY.—10 A.M., Skin Out-patients. 12 noon, Lecture, Therapeutics. 2 P.M., Operations, Medical, Surgical, and Throat Out-patients. 4.15 P.M., Lecture, Mr. Vlasto: Hoarseness.

SATURDAY.—10 A.M., Medical and Surgical Wards, Surgical and Children's Medical Out-patients.

The lectures at 4.15 P.M. are open to all Medical Practitioners without fee.

ROYAL INSTITUTE OF PUBLIC HEALTH, Queen-square, W.C.

WEDNESDAY, Jan. 25th.—4.30 P.M., Dr. R. Fortescue Fox: Rheumatism as a Social and Industrial Problem.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.

THURSDAY, Jan. 26th.—9 P.M., Mr. Y. Bell: Frequency of Micturition in Women.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Jan. 24th.—3.15 P.M., Mr. A. M. Zamora: Present State of the Tonsil Question.

ST. MARK'S HOSPITAL, City-road, E.C.

THURSDAY, Jan. 26th.—4 P.M., Mr. E. T. C. Milligan: Post-operative Intestinal Obstruction.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Jan. 27th.—4 P.M., Mr. A Ryland: The Temporal Bone (lantern).

ST. THOMAS'S HOSPITAL, Albert Embankment, S.E.

THURSDAY, Jan. 26th, and following FRIDAY.—5 P.M., Prof. E. Mellanby: Iodine and the Thyroid Gland.

ST. PETER'S HOSPITAL FOR STONE, Henrietta-street, W.C.

WEDNESDAY, Jan. 25th.—3 P.M., Mr. J. Swift Joly: Renal Calculi.

HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.

THURSDAY, Jan. 26th.—3 P.M., Dr. Wilfred Harris will demonstrate.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.

WEDNESDAY, Jan. 25th.—4 P.M., Mr. McKim McCullagh: The Antenatal Examination.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Jan. 24th.— 5 P.M., Dr. S. E. Dore: Affections of the Hair and Hair Follicles.

THURSDAY.—5 P.M., Dr. M. Sydney Thomson: Lichen Planus.

ST. MARY'S HOSPITALS, Manchester.

FRIDAY, Jan. 27th.—4.15 P.M. (at the Whitworth-street West Hospital), Dr. Lapage: Acute Inflammations of the Brain in Children, including Meningitis, Encephalitis, Polio-encephalitis, and Vaccinial-encephalitis.

LONDON JEWISH HOSPITAL, Stepney Green, E.

THURSDAY, Jan. 26th.—4 P.M., Dr. L. Forman: Psoriasis.

GLASGOW POST-GRADUATE LECTURES.

TUESDAY, Jan. 24th.—3.30 P.M. (in the Faculty Hall, St. Vincent-street), Prof. C. Browning: Tissue Defences against Infection.

WEDNESDAY.—4.15 P.M. (at the Eye Infirmary), Dr. J. B. Stewart: Eye Cases.

# Appointments

HOPKINS, U. M., L.R.C.P. Lond., M.R.C.S., has been appointed Surgeon under the Factory and Workshop Acts for Exmouth.

Chelsea Hospital for Women: BLAIKLEY, J. B., M.B., B.S. Lond., F.R.C.S. Eng., Pathologist; VARTAN, C. KEITH, F.R.C.S. Eng., Registrar.

# Births, Marriages, and Deaths

## BIRTHS

BATEMAN.—On Jan. 11th, at 29, Trafalgar-square, S.W.3, to Peggy (née Turner), wife of Geoffrey H. Bateman, B.M.—a daughter.

BRICE-SMITH.—On Jan. 6th, at Rose-hill, Dorking, the wife of Dr. H. F. Brice-Smith, of a son.

ELLIS.—On Jan. 9th, at The Poplars, Bourton, Dorset, the wife of Dr. George E. Ellis, of a son.

TYLECOTE.—On Jan. 14th, the wife of Frank E. Tylecote, M.D., F.R.C.P. Lond., of Heaton Lodge, Heaton Mersey, Manchester, of a son.

## DEATHS

BIRD.—On Jan. 15th, very suddenly, at Cooksditch, Faversham, Kent, Martin Wright Kidman Bird, F.R.C.S Eng., aged 43.

GILL.—On Jan. 13th, suddenly, at Shaftesbury, Richard Gill, M.D., B.Sc., F.R.C.S., of Albert Hall Mansions, S.W.

HALE.—On Jan. 11th, George Ernest Hale, Lieut.-Colonel, I.S.O., late R.A.M.C., of Littlecroft, Bath-road, Felixstowe, in his 72nd year.

HIND.—On Jan. 10th, at Rivermead-court, S.W., Alfred Ernest Hind, F.R.C.S., of Portland House, Jersey, in his 73rd year.

JONES.—On Jan. 14th, at Bodynfoel, Llanfechain, Montgomeryshire, the residence of his son-in-law, Sir Robert Jones, Bt., K.B.E., C.B., F.R.C.S., of Belvidere-road, Liverpool, aged 74.

LEE.—On Jan. 11th, very suddenly, Harry Lee, F.R.C.S., of Clough House, Chapel Allerton, and Park-square, Leeds.

MCALLISTER-HEWLINGS.—On Jan. 12th, at "Inversnaid," Forest-road, Quorn, Leicestershire, William Frederick McAllister-Hewlings, M.B., C.M. Edin., R.A.M.C., T.A., in his 65th year.

*N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.*

# NOTES, COMMENTS, AND ABSTRACTS

## OCCUPATIONAL THERAPY

By NORAH A. HAWORTH, M.A., M.R.C.S., D.P.M.
ASSISTANT MEDICAL OFFICER, SEVERALLS MENTAL HOSPITAL COLCHESTER

"Love labour," said William Penn, "for if thou dost not want it for food, thou mayst for physic."

Occupational therapy has been defined as "any activity, mental or physical, definitely prescribed and guided, for the distinct purpose of contributing to and hastening recovery from disease and injury." It is a form of treatment which is extending steadily year by year, and is now applied to patients who are suffering from physical disease or trauma though its greatest scope probably lies in the mental hospital. In the United States occupational therapy departments have been established in the surgical and orthopædic departments of general hospitals, in out-patient clinics, in sanatoriums, and in the majority of the mental hospitals, while in many of the largest cities occupational therapists are employed by medical practitioners in private practice. In the hospitals the occupational therapy department is a properly organised department with workshops, adequate equipment, and a trained staff of instructors.

### In General Hospitals

In orthopædic hospitals and in the surgical wards of general hospitals, occupational therapy is being used to restore function to stiff joints and paralysed muscles, to improve coördination of movement, and to prevent atrophy in cases where patients must remain in bed for long periods and there is a risk of healthy muscles becoming atrophied. The particular type of occupation prescribed in each case is of the utmost importance if it is to be of therapeutic value, and a considerable amount of research has recently been done on this subject and the different crafts have been carefully analysed and records made of the movements and muscles involved in each type of work. By a careful selection of occupation almost any joint or group of muscles may be re-educated (where re-education is possible). For example, the making of hooked rugs brings into use the shoulder and back muscles; loom-weaving requires flexion and extension of the knee-joint; to re-educate the hand muscles an occupation requiring tools which must be repeatedly picked up, grasped, and put down again (block-printing) should be chosen rather than one where the tool is held in the hand for long periods.

In one hospital the after-treatment of joint fractures is always carried out in the occupational therapy department.

A patient suffering from a joint fracture attends three times a week. Each time he receives three periods of treatment each lasting from three to ten minutes, or till he is tired, with rest intervals between. Patients suffering from Colles's fracture go on the tenth day. They are first given block-printing which improves the grasp of the hand (in gripping the roller) and increases flexion and extension of the wrist. A small hammer is used at first and the weight is gradually increased. Patients suffering from a fractured ankle are put to sawing wood on a treadle saw. They are given thin wood at first and its thickness is gradually increased.

It has been found that patients tend to improve more quickly when re-education of the muscles or joints is applied in the form of some useful occupation rather than through massage, passive movements, and stereotyped exercises. In the latter case his whole attention is focused upon his particular disability, while in the former he tends to forget it. Treatment by occupation is also prescribed for arthritic patients, and here also it has been found that whereas such patients tend to resist passive movements which cause them pain, when interested in some special form of work, they use their hands or limbs willingly and tend to forget the pain. In these clinics one instructor is able to treat about 20 patients in the half-day.

### In Sanatoriums

It has been said of tuberculous patients that "nature heals and the patient helps by securing rest, fresh air, proper and sufficient food, and by maintaining a sanguine and tranquil state of mind." All these, with the exception of the last, he secures on entering a sanatorium, and it was to produce the "sanguine and tranquil state of mind" that occupational therapy was introduced as a part of their treatment. This was done first at Frimley, in England.

When first admitted to a sanatorium many patients must remain in bed for some time. During this period absolute rest is aimed at. It was realised that if real rest were to be obtained, mental rest was just as important as bodily rest. For some people it is impossible to lie still and not become restless; nor is a patient who lies in bed worrying about financial troubles and difficulties at home, filled with anxiety as to the future, or fear as to the development of his own illness really resting; and as is always the case, the mental state reacts upon the physical and he does not make the improvement he should. The superintendent of one sanatorium writes: "When I was taking treatment in a sanatorium for tuberculosis I think I saved myself from going out of my mind by learning to embroider!" Investigations have been made with regard to the amount of work that patients may be allowed to do during different stages of the disease and into the type of handicrafts which may or may not be used with tuberculous patients. This is very important since fatigue may have a very injurious effect and lead to a rise in temperature, &c. For example, loom work may be dangerous as it requires too great a use of the chest muscles, wood-carving and book-binding are too heavy, white needlework done for any length of time out of doors may cause eyestrain. The crafts which have been found most satisfactory for sick patients are basketry, clay modelling, knitting, leatherwork, beadwork, and toy-making; while convalescent patients are employed in woodwork, metal work, chair-caning, pottery-making, dress-making, millinery, shorthand, book-keeping, and typewriting. Carefully graduated programmes have been worked out with the object first of diverting the patient's attention from himself and maintaining the "sanguine and tranquil state of mind"—that is, of treating the mental states associated with the disease (depression, anxiety, apprehension, and loss of self-confidence)—and secondly of providing prevocational work for convalescent patients. Here the therapeutic value of the occupation remains the same, but the patient may also be learning some new type of work which may be of use to him later if owing to his illness he is unable to return to the work to which he is accustomed.

### Discharged Patients

Attempts have been made in some cities in the United States to extend the occupational therapy departments of the hospitals so that patients who have been discharged but who are not yet fit to return to their work may continue to derive benefit from them. In some cases they return as out-patients to the occupational therapy department of the hospital and continue treatment there until completely recovered. In other places "sheltered" or "curative" workshops have been set up which provide work for patients who are unable, temporarily or permanently, to return to work under ordinary competitive conditions. In these shops they are given the opportunity of working, under supervision, for as many hours daily as they can at a fair

remuneration. One of these curative workshops, where physical and occupational therapy are used for industrial accident cases, received some $8000 in 1920 from insurance companies in payment for treatment of cases. Insurance companies would be unlikely to expend this money unless they were satisfied that the time for payment of compensation was thereby reduced.

The organisation of these workshops varies a little. One in Rochester, N.Y., receives all types of cases. Patients are referred to it by hospital clinics, by various social and relief agencies, and by private physicians.

All patients go to the occupational therapy department on admission and from there those requiring special training are passed on to the industrial therapy department where they receive a hardening process until they are capable of full-time employment. The work is done under normal industrial conditions under an experienced foreman. Payment is made on a piece-rate basis but is very small and is in no way a substitute for compensation. Cases of tuberculosis, heart disease, psychoses, neuroses, post-operative and orthopædic conditions are all treated in this workshop which has proved to be self-supporting and reports a return of about 64 per cent. of the patients treated to full-time work. Another shop gives free treatment in the shop and at home to cases unable owing to their illness to attend the shop, and charges $1 for patients outside the city and gives instruction to non-patients for $1 per lesson. Each patient must bring a card from his doctor stating what sort of work he is capable of and how much he may do each day. The shop pays for the materials and the patient is paid for work when it is sold. Workers may keep their own work by paying for the material and a small extra charge to cover overhead expenses. About 135 patients are treated in this workshop.

Some private clinics have also been opened by trained occupational therapists. In them no cases are received without a medical prescription. One such clinic reports special success with cases of infantile paralysis sent for functional restoration, and also several cases where, owing to some permanent disability following accidents, patients have been trained in some new craft which enables them again to earn their own living—for example, a chauffeur who had become blind, became an efficient rug-maker; and a blacksmith who was taught a specialised form of wrought-iron work became so proficient at it that his former employer fitted up a workshop for him in his own home and kept him permanently supplied with work.

Perhaps most of all in the case of tuberculous patients do these industrial workshops meet an important need, and for this particular group of patients colonies or centres have been established in other countries, as for example at Papworth Hall, in England, and by the Italian Red Cross at Al Cuasso Al Monte, in Italy.

### In Mental Hospitals

It is probably in mental hospitals that the greatest scope for occupational therapy is found. The patients who enter these hospitals fall into two groups: first, those who may recover; and secondly, the chronic cases who will in all probability spend the rest of their lives in hospital. The occupational therapy department is concerned with them all. The aim of those in charge of these patients is to help them to readjust themselves to life and to guide them back to a useful life in the outside world or in the hospital community.

Taking as its aim the making of each patient into a socially useful member of the community, occupational therapy in a mental hospital includes: (1) therapeutic work which is prescribed as a definite part of treatment, and with the intention of improving the patient's mental state; and (2) non-therapeutic work among chronic cases which is none the less valuable in that it keeps the patients healthy and as near normality as is possible for them, and because it makes possible the carrying on of the work of the hospital and enables those who would otherwise be a burden on the community to contribute in some measure to the cost of their maintenance. In this class are found the imbeciles, the feeble-minded, the secondary dementias, and a number of dementia præcox cases, all of whom are capable of good work under supervision. Though these patients are not likely to improve they should be kept occupied, first, because occupation of some kind is necessary to a normal life and they will be much happier and healthier if useful members of the hospital community; secondly, because, as is constantly being proved in the wards of a mental hospital, "Satan finds work for idle hands to do"; thirdly, as a duty to society; and lastly, because occupation retards regression and dementia.

One aims, of course, at employing all these patients in the hospital industries; a few can be sent there immediately on admission but the majority cannot, and it is for this reason that a properly organised occupational therapy department, with different grades as it were, is of value. Such a department will include provision for the employment of patients on admission. This may be in bed, in a ward occupational therapy class, or in the work of the ward. In this grade the work is therapeutic; the patients are under constant individual supervision, and the work should be carefully and deliberately prescribed with the intention of helping them towards recovery, or with the purpose of training them to become useful hospital workers. From this grade the patients are passed on—the possible recoveries to larger occupational therapy centres, for example, a sewing-room or weaving or handicrafts room, where they will receive less individual attention but will still be under the constant supervision and guidance of an instructor who will understand their mental state and endeavour to select the form of occupation that is most likely to benefit them, and they should spend part of each day in one or other of these classes until discharged from the hospital. The chronic cases are passed on to the hospital industries: laundry, sewing-room, tailor's and carpenter's shops, &c. Experience has shown that chronic cases who have been sent to the workshops shortly after admission have frequently been returned to the ward as unfit, but the same patients, after some weeks' training in a small centre, get into the way of regular occupation and when sent again prove to be useful workers.

Many chronic cases, of course, cannot be sent to the workshops; some of these can be taught to work in the wards but others, either because their mental state remains too acute—they are too noisy, destructive, restless, agitated, liable to impulsive outbursts—or because they remain incapable of attending to themselves in any way without constant stimulation. Such patients drift into the acute or "refractory" or the "lost" wards of the hospital, and until recently their condition has been regarded as hopeless. Handicraft classes, however, when started in the "refractory" wards have shown that a large number of these patients can be taught to occupy themselves usefully for long periods each day. The type of work given to them is necessarily limited as nothing requiring tools with which they might injure themselves or others may be introduced into such wards, but rug-making, certain kinds of weaving, needlework, basketry, and the preparation of old "useless" material—i.e., unravelling of old stockings, tearing into strips of old materials for rug-making, &c.—will provide an adequate variety of occupation which, besides being useful, will keep such patients employed and out of mischief and introduce into the ward an atmosphere of quiet and industry in place of one of quarrelling, noise, and strife.

#### HABIT-TRAINING CENTRE

For the treatment of the "lost" patients, the majority of whom belong to the dementia præcox group, the habit-training centre has been introduced. These patients have gradually lost interest in the external world, till finally they have ceased to take any interest in anything outside the world of phantasy

in which they live. They are completely indifferent with regard to their personal appearance and many reach the stage where they are faulty in habits and will neither wash, dress, nor feed themselves. Superficially there is no apparent difference between these "lost" patients and those cases of secondary dementia who have reached a similar stage, but there is this difference, that whereas in the latter, though the progress of dementia may sometimes be retarded for a time, they do not improve; among the dementia præcox cases from time to time patients do improve, and when they improve they show very little sign of mental deterioration. It is also found that when one has time to persevere with individual patients and make them attend to what one wants them to do, they can do it perfectly well.

They have regressed to a state similar to that of babyhood where everything is done for them, where they have no responsibilities of any kind, and where their mind is occupied in a world of its own. Habit-training is necessary in a child to teach him to control his own body and to adapt himself to his surroundings. Physical control he learns by developing regular habits, emotional control through his work and play with others. The foundation of a habit depends upon repetition and upon never allowing an exception, and it is very little use to make a patient clean his teeth or button his shoes, or tidy his hair one day then leave him for a week, then start teaching him again. The chief value of the habit-training centre lies in the fact that every patient is supervised and trained every day until new and correct habits are formed. A definite schedule is followed from the moment the patients get up in the morning till the moment they go to bed and, where necessary, during the night. It is arranged as far as possible so that the patient leads a normal life and includes work, exercise, and play.

The following programme* is adopted in the habit-training centres of the New York State mental hospitals:—

*A.M.*—6: Rising bell. 6 to 7: Wash, brush teeth use mouth wash, dress, lace shoes, comb hair, air beds properly. 7 to 7.30: Breakfast. 7.30 to 8.30: Train patients to make beds, sweep floors, and general care of wards. 8.30 to 8.45: Prepare for physical exercise. 8.45 to 9.30: Marching, free hand calisthenic work. All windows open, or exercise carried on out of doors. Pass water. 9.30 to 11: Assigned occupational work, except with certain groups when the time is limited by the physician. 11 to 11.30: Water, make person tidy for dinner. 11.30 to 12: Line up to roll call for dinner.

*P.M.*—12 to 12.30: Dinner. 12.30 to 1.30: Absolute rest. 1.30 to 2: Pass water, prepare for occupational treatment (brush hair, wash hands). 2 to 3.45: Assigned occupational work. 3.45 to 4.30: Walk out of doors three-quarters of an hour. 4.30 to 5: Water, make person tidy for supper. 5 to 5.30: Supper. 5.30 to 7.30: Comfortable on ward, reading, games under direction, singing if possible. 7.30 to 8: Wash, brush teeth, ready for bed. Bed-wetters should be taken to toilet at regular intervals during the night; at 10 P.M., 2 and 6 A.M.

Occupational therapy in this ward consists of unravelling and winding, rug-making, weaving on frames, raffia and basketry work, brush-making, and needlework.

The habit-training centre consists of 25 patients, 3 nurses, and an occupational therapist.

One hospital started a ward of this kind in 1927 with 12 patients and the results of the treatment have been such that they now have five classes, the ward consisting of 70 instead of 12 patients, and they are hoping to organise classes for another 70 in the near future. Of the 70 who have received treatment at the centre they report that instead of 70 patients requiring handfeeding, 24 now do; instead of 30 requiring dressing, 3 now do. There has been marked improvement in 20 per cent. of the cases, moderate improvement in 40 per cent., and no change in 40 per cent. Another hospital reports that of 75 cases treated, 12 improved sufficiently to be sent home on trial, 13 to be sent to the hospital industries, and 24 to be sent to better wards where individual attention was not considered necessary.

* Reproduced by kind permission of Mrs. E. Clark Slagle, Director of Occupational Therapy, New York State Department of Mental Hygiene.

All the cases treated have been of the lost, deteriorated type; better results are naturally obtained with early cases than with those in whom bad habits have existed for years, and the cases treated in the habit-training centres up to date have been definitely selected. They must (1) be under 35 years of age; (2) not have been more than 15 years in a mental hospital; (3) have been of fair mental development before the onset of their illness.

The amount of help that a patient may obtain from occupational therapy depends in a very large measure upon the occupational therapist, upon her tact, sympathy, and power of understanding the patient's mental state and individual needs. In most cases any employment is better than none, but work selected for each individual patient with his or her particular needs in view is likely to help them far more than work given to them haphazard. For example, if a patient is given work that she is mentally incapable of doing satisfactorily she will become depressed, her lack of self-confidence may be increased, she will lose interest, and probably give it up. On the other hand, if an intelligent patient is given something mechanical that requires very little concentration, she will do it mechanically and will occupy herself during the whole period of the class, but the therapeutic value of the work will probably be practically nil. The purpose of the occupation is to engage the patient's mind so that while she is at work the sense of depression or the delusions from which she suffers, or the hallucinations which distress her when her attention is not otherwise held, are driven out.

This is illustrated in the case of a restless patient suffering from distressing auditory hallucinations who was sent to the occupational therapy department shortly after her admission to the hospital. She was put to work at rug-making on a loom. The work was new to her and occupied all her attention. She said that while she was busy she did not "hear the voices," looked forward to the class and improved generally for about a fortnight. Then she became restless and anxious again and her work no longer helped her. She had been working on a plain rug and it was found that she could now do the work quite mechanically without paying much attention to it; she was moved to another rug in which a complicated pattern was being introduced which required her full attention and again she improved. The patient herself noticed what happened and next time asked for a change of occupation.

It must be remembered, however, that work in the occupational therapy class is not necessarily the best treatment for all patients; some will improve more rapidly as ward-workers.

For example one overactive patient who was rather resentful of her detention in hospital, on being asked at the end of a couple of weeks how she was getting on in the handicrafts class, shrugged her shoulders and said, "Oh, you mean the kindergarten class, waste of time!" She was handed over to the charge nurse who employed her in the ward where she settled down and became much happier and more amenable to treatment.

On the other hand many patients, if given mending or ward work to do will become resentful and say that if they can do that kind of thing in hospital they could be doing it at home, that they did not come to work, &c. It is for the occupational therapist to discover the particular need of each patient, and it will thus be realised how important it is to have trained workers.

### Training for Occupational Therapy

In this country there has been until quite recently no recognised training centre for the occupational therapist. The work has been done in some hospitals by nurses who, after taking their nursing certificate, learn some handicrafts and then take on the work of occupational therapist; others have had no medical training, but have a technical knowledge of certain crafts; both learn gradually by experience how to make their work of therapeutic value and not simply a form of employment. In the United States there are a number of recognised training schools, the students of which, when they have completed their

training, may become registered as occupational therapists.

### Historical Review

The idea that occupation is therapeutic and beneficial to the sick is by no means a new one. As long ago as A.D. 172 Galen wrote "Employment is nature's best physician." In 1798 Dr. Rush, of Philadelphia, prescribed "spinning, sewing, and churning" for his women patients in a mental hospital in Philadelphia; "grinding corn, gardening, and cutting corn" for the men. Again, about 1815 we find the therapeutic value of occupation in a mental hospital being discussed in a correspondence between a physician of the York Retreat and one of the founders of a hospital for the insane in New York. In it we hear that one of the leading features of the new hospital is to be the introduction of employment for the patients; and that in a hospital in Spain which received patients of all ranks the proportion of recoveries among the lower classes, who were employed in the work of the hospital, was much greater than that among the idle grandees. But up to the time of the Great War, in most hospitals little was found in the way of occupation apart from the hospital industries. Successful work was being done here and there by a few individuals who were attempting not simply to occupy and amuse patients, but to treat them through occupation, and it was their success with isolated cases that led the authorities in various hospitals to consider the training of workers definitely for this purpose, for it was seen that if the full possibilities of the work were to be realised the workers must have some definite training. First, they must have in the case of workers with orthopædic and surgical cases a knowledge of anatomy, in the case of workers with mental patients a knowledge of psychology and mental diseases; secondly, they must have a practical knowledge of suitable handicrafts; and thirdly, they must understand how to apply those handicrafts to meet the need of each individual patient.

The first school of occupational therapy was founded in Chicago and was the only one up to the time of the war, when far more trained workers were demanded from it than it could supply. After the war, in 1920, the American Association of Occupational Therapists fixed a standard of training and stated the minimum requirements. These now include:—

1. A certain standard of intelligence and education for admission to the course.
2. A minimum course of 12 months of which not less than eight shall be spent in practical instruction in handicrafts and lectures.
3. Not less than six months (in some schools it is nine) of practical training in a hospital under a trained occupational therapist.

Each student thus, before commencing work independently, acquires a thorough training in theory and technique, and has had some months' actual experience, during which she has had the opportunity of working under an experienced person and of observing all the little details which will add to the value of her class.

In the arrangement of her room she will learn to use separate small tables for patients who tend to be more interested in other people's work than their own and irritate and interfere with others (manias), or for certain melancholias who like to recount all their troubles to their friends—though certain patients are stimulated by their neighbours. She will observe that confused patients who cannot concentrate sufficiently to understand verbal instruction may sometimes be taught to do simple things by guiding their hands—that the dull, mechanical work, cutting wool, stitching braid, &c., which is necessary to provide the department with materials, but which would fail to arouse any interest in the majority of patients, can be satisfactorily done by the senile dementias, and many other details.

### Finance

Apart from the salaries of the occupational therapists it is possible for an occupational therapy department to be self-supporting. Whether it is or not depends to a very great extent on the care and ingenuity of the occupational therapist. A certain quantity of new material and tools are essential, but an enormous amount may be done with the discarded and waste articles from other departments of the hospital.

Old clothes may be cut up and used for many purposes, condemned linen, sugar sacks, and old stockings dyed and cut up or unravelled provide material for rugs, weaving, and embroidery; old jam pots may be used for painting, tins for enamelling, &c. All these provide material for useful and saleable articles, and are but a few of the things which may be put to a good use that would otherwise be thrown away.

For the disposal of finished articles in some hospitals there is a permanent exhibition of completed work and patients, visitors, and staff may buy things whenever they wish. Other hospitals hold an annual sale for the public and allow staff and patients to purchase things throughout the year. It is, of course, up to the occupational therapist to see that useful and attractive things are produced in the department, partly because they will be more easily sold, but still more because the patients themselves will be more interested in making such things than in producing useless articles. It must, however, be clearly understood throughout the department that the commercial side must always be subsidiary to the therapeutic; that the purpose of the department is to heal the patient and never to make money; that if no article were sold the value of the work done would still be just the same, and no patient should ever be put to or kept at work which is not the most helpful to him or her simply to produce saleable goods.

In hospitals, where it is possible to employ a sufficient number of occupational therapists to organise the work on a large scale and attempt to occupy the majority of patients in the wards, the occupational therapist may replace a nurse for long periods each day; this, of course, is not possible where only small classes consisting of a few patients from a ward can be held. It must be remembered, however, that if through treatment in the occupational therapy department the length of a patient's stay in the hospital is diminished, this in itself results in a considerable saving in public expense.

### Recreation

In some hospitals the occupational therapy department undertakes also the organisation of recreation and amusement. Recreation officers are attached to the department and regular programmes are followed which provide daily exercise, in the form of gymnastics, gardening, organised games, swimming, walks; and amusement in the form of concerts, singing classes, music, wireless, cinemas, dances, socials, for all patients. In other hospitals recreation and amusement are arranged independently. All are equally important and play their part in helping the patient to readjust to normal life. Many patients, who in the ward are difficult to manage, mischievous, impulsive, restless, and unable to settle to anything, will give no trouble whatever in a gymnastic or Morris dancing class, but will coöperate and work well. This helps them to redevelop their power of self-control and concentration. On more than one occasion patients who have remained dull, apathetic, and impossible to stimulate, have first shown signs of returning interest in external things during the Christmas parties which are held in all hospitals—this occurred on one occasion in the case of a stuporose dementia præcox who had remained two years in bed, requiring every attention, including washing and feeding.

Music, too, has an influence on many patients and may create a change of mood. Hostile patients may become friendly, and solitary patients more sociable under its influence. It is not, however, invariably beneficial, and on one occasion an improving melancholia after listening to two or three gramophone records became acutely agitated and relapsed into a state of extreme depression, while another patient recovering from an acute hallucinosis on first hearing

some singing on the wireless, screamed "Oh, those awful voices again," and relapsed into a state of acute agitation. But these cases are exceptional.

The need that is felt for occupation and self-expression in some form by most individuals is illustrated if one walks through the wards of a mental hospital in which no form of occupation is provided. Patients are to be seen attempting to provide it for themselves, some may be seen knitting on hairpins, unravelled stockings being used for wool; odd things being made with ingenious tools they have created for themselves, sometimes beautiful embroidery is being done on old scraps of material. Some time ago an exhibition was held at a mental hospital in the United States of this kind of work done by patients in the hospital. Some of the exhibits had been created simply for the pleasure of producing something beautiful or useful; others, however, were of greater interest, for example, several complicated wood and metal machines one of which, the patient who made it claimed, controlled all the deliberations of the League of Nations, while another was said to regulate the movements of the universe and to direct the stars in their courses. The examination of this unguided occupation shows that what might be useful labour is being wasted, beautiful work often being done on worthless material; that great ingenuity is being used to no purpose, and in addition to this the work is often carrying the patient further into the world of phantasy and strengthening and emphasising delusions.

The occupation of the sick is still regarded by many as a diversion or amusement which will "take the man out of himself" for a short period and thus temporarily relieve his trouble, and this was no doubt the original purpose of those who attempted to employ their patients and it still serves this undoubtedly important purpose, but experience has shown those who have used it that it may be made to serve many other purposes and may, if prescribed and applied scientifically, prove a valuable form of therapy instead of an amusement which may or may not benefit the patient. It must be always remembered that occupational therapy is only a part of general therapy. It does not cure, nor does it claim to do so, but it does assist and hasten cure.

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## A CHILD GUIDANCE CONFERENCE

THE staffs of all the clinics in Great Britain organised on child guidance lines met in conference on Jan. 7th–8th in London, with Dr. William Moodie as president. After the first two sessions, the psychiatrists, psychologists, and social workers met separately under the chairmanship of Dr. Emanuel Miller, Dr. Lucie Fildes, and Miss Doris Robinson, respectively, who reported to a final meeting upon the general findings of the three sections.

The psychiatrists discussed the status of the social worker in relation to the psychiatrist and the families being investigated. While the social worker was trained to take a detached view of the field she was investigating, there was some danger, it was felt, of her establishing such emotional relationships with the family that the work of the psychiatrist might thereby be handicapped. While the value of the unity of psychiatrist, social worker, and psychologist was recognised, it was felt that a clinic was most successful where the physician maintained his authority in directing the social worker; in making suggestions as to approach; and deciding at case conferences where the future treatment of the child should lie—that is, in the psychiatric, the social, or the psychological field. The open case conference on a half-developed case was apt to misrepresent to casual visitors the work of child guidance. The investigation of play, both group and individual, was regarded as of first importance for diagnosis and cure in any clinic. Much could be gleaned of a child's social behaviour, intelligence, and emotional reactions from these observations, but it was premature to base their interpretation on current theories. The value of personality tests was considered, particularly the use of the Rohrschach tests; it was felt that discoveries could often be made on purely clinical lines without the use of time-devouring tests.

The social workers' group discussed means of organising their work under methods of treatment varying according to the views of the psychiatrist with whom they work. In small clinics where medical staff is part-time only, much responsibility for adjustment falls upon the social worker. Emphasis was laid on the need, when treating behaviour problems, of knowing working-class living conditions and standards, and of basing plans upon the real possibilities for adjustment.

In the psychological section discussion on clinical diagnosis and treatment developed the following points. Individual free play is recognised as a method of observation and as of probable therapeutic value; in certain selected cases more organised social and constructive play activity may be a profitable line of treatment. Control groups are necessary for the provision of data bearing on the value of treatment; though difficult, this method of evaluation is not impossible. The most hopeful line of growth of personality tests appears to be in the discovery of group factors underlying certain types of behaviour. While work in these directions has already given profitable results, much more experiment is needed before they can be used clinically.

The conference was held at the Institute of Medical Psychology under the auspices of the Child Guidance Council of Great Britain.

## NURSING HOMES

Two small books recently issued provide between them probably as much information about nursing homes in this country as can be made available without infringing laws, written and unwritten. What a doctor really wants to know about a home is whether the accommodation and food is good for the price charged; whether the amount of actual nursing provided, and personal attention, day and night without extra charge for a "special," is at least up to the somewhat low standard customary in such institutions; whether there is a lift; whether the patient's bell is answered promptly; whether trained nurses only are employed; and many other things of this kind. This information is, however, unobtainable, except through personal experience; incidentally, a record of impressions of any particular home mentioned would soon make a directory of names and addresses a very useful document to its owner and his patients. Nursing Homes, 1933,[1] provides a list of registered nursing homes in England and Wales, Scotland, and Ireland, arranged according to counties and towns, with full address and telephone number, and a note whether medical, surgical, maternity, or only convalescent cases are accepted. Where, as sometimes occurs, more particulars are available among the advertisement pages, a reference to the appropriate page is also given; but even there the weekly terms are not always stated. London nursing homes are classified under postal districts. The book also contains a short list of mental homes, no indication being given whether certified or uncertified, or both types of cases are accepted. In the advertisement pages are set out trained nurses' institutes, hotels, and guest houses, a scholastic and

[1] Edited by J. Eaton Hosking. London: Ernest Benn, Ltd., 1933. Pp. 257. 4s.

nursery home section, and a physiotherapy section, as well as nursing and mental homes.

The London Register of Nursing Homes and Medical Institutions, 1932-1933,[1] contains much useful information with regard to a limited area. Nursing coöperations and institutes are detailed, and lists of nursing homes are classified, perhaps redundantly, according to metropolitan boroughs, alphabetically, and also according to postal districts. The number of beds and terms per week are stated in most cases, as well as telephone numbers and type of cases admitted. The massage section contains "some members of the London branch (of the Chartered Society of Massage and Medical Gymnasts) in general practice." The up-to-date account of the accommodation available for paying patients in general and special London voluntary hospitals will be found useful, and also the lists of days and hours of attendance for out-patients in these hospitals. We could have spared the two pages devoted to "Therapeutic Suggestion," and would have welcomed, in both directories, a list of visiting nurses for private patients, or at least an asterisk indicating which nursing coöperations and institutes were prepared to supply these on demand.

## HISTORY OF THE SAMARITAN FREE HOSPITAL

Dr. Oxford has been a member of the committee of the Samaritan Hospital for nearly half a century, and his vivid interest in its affairs has led to the collection of its annals.[2] These take the form of a brief annual chronicle from its foundation in 1847 in Gray-street, Manchester-square, as "The Gynepathic Institute Free Hospital," to 1930, and a very curious chronicle it makes. Many of the early years of the hospital's existence were marked by constant squabbles among the staff, medical and lay, and by wars of letters and pamphlets, ending in litigation and in the imprisonment of the chairman of the committee for unpaid costs. There were difficulties with secretaries, dispensers, and collectors; the first president, Lord Ashley, afterwards the philanthropic Earl of Shaftesbury, resigned; a subsequent one, Lord Cardigan, was summarily deposed on the grounds that he did not pay his subscription, failed to answer letters, and took no interest in the hospital. Here and there we get a touch of comic relief. The Rev. Robert Montgomery, the poet, who is now chiefly remembered as the subject of a scathing article by Macaulay, consented to preach on behalf of the institution on condition that the committee bought 100 copies (at 3*s.* 6*d.*) of his book on Luther, and offered to do it again on the same terms; collectors were paid a penny for every person who refused to give them a donation. A matron ordered grapes and asparagus for her own table and charged them in the bills as cabbages, and eventually committed the fatal mistake of being found on a racecourse by the president when she was supposed to be on duty. This, needless to say, was as long ago as 1883. Meanwhile the hospital had been gaining a high reputation for Spencer Wells's ovariotomy operations, his first successful one having been performed in 1858. The diet-table of patients recovering from this operation is a marvellous document. For the first few days they had beef-tea, arrowroot, and brandy "every five or ten minutes"; about the eighth day their diet was enriched by the addition of fish, light pudding, port or champagne. At the end of a fortnight they absorbed sustenances 11 times between 6 in the morning and 8 at night. After breakfast and before the 12 o'clock dinner they were thrice given wine and biscuits, and once bread and meat, with wine or beer. Brandy and soda accompanied dinner, and after tea there was a "pick-me-up," also of brandy and soda. At 8 o'clock in the evening the patient was comforted with "sandwiches and bitter beer," and hunger during the night was guarded against by a supply of "sandwiches, beef-tea, wine and brandy." The appendix, having been written in 1925, is, as the author admits, now out of date, and might with advantage have been either revised or omitted.

[1] London: H. L. Baynham. 1932. Pp. 91. 2*s.* 6*d.*

[2] History of the Samaritan Free Hospital. By Arnold Whitaker Oxford, M.A., M.D. With an Appendix on the London Hospitals and Dispensaries. Cambridge: W. Heffer and Sons. Pp. 96. 3*s.* 6*d.*

# Vacancies

*For further information refer to the advertisement columns*

*Banbury, Oxon, Horton General Hospital.*—Res. M.O. At rate of £150.

*Birmingham, Selly Oak Hospital.*—Cas. O. At rate of £200.

*Blackburn Royal Infirmary.*—Res. H.P. and Fourth H.S. £175 and £150 respectively.

*Bradford Royal Eye and Ear Hospital.*—Jun. H.S. £150.

*Bradford Royal Infirmary.*—Three H.S.'s. Each at rate of £135.

*Bristol Royal Infirmary.*—H.P.'s and H.S.'s to Special Depts. Each at rate of £60.

*Bristol, Southmead Hospital.*—Res. Obstetric Officer. At rate of £200.

*Bury Infirmary, Lancs.*—Sen. H.S. At rate of £200.

*Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.*—Third Res. H.S. At rate of £75.

*Charing Cross Hospital, W.C.*—Asst. Surgeon. Also Res. M.O. £350.

*Cheltenham General and Eye Hospitals.*—H.P. £200.

*Denbigh, North Wales Sanatorium, Llangwfan.*—Jun. Asst. Res. M.O. £250.

*Derbyshire Education Committee.*—Asst. School M.O. £500.

*Dudley, Guest Hospital.*—Asst. H.S. £170.

*Durham County Mental Hospital.*—Med. Supt. for Winterton Mental Hospital, Stockton-on-Tees. £900.

*Eastbourne, Princess Alice Memorial Hospital.*—H.S. At rate of £150.

*East Ham Memorial Hospital, Shrewsbury-road, E.*—Hon. Surg. to Ear, Nose and Throat Dept., Res. M.O. At rate of £200, and Refraction Asst. £65.

*Evelina Hospital for Sick Children, Southwark, S.E.*—H.P. At rate of £120.

*Exeter, Royal Devon and Exeter Hospital.*—H.S. At rate of £150.

*Glasgow Royal Infirmary.*—Radium M.O.

*Halifax, St. Luke's Hospital.*—Consulting Physician.

*Hampstead General and N.W. London Hospital, Haverstock-hill, N.W.*—H.P. At rate of £100.

*Hertford County Hospital.*—H.P. At rate of £150.

*Hospital for Consumption and Diseases of the Chest, Brompton, S.W.*—Asst. Physician.

*Leeds General Infirmary.*—Hon. Ophth. Surgeon.

*Lewisham Hospital, High-street, S.E.*—H.P. At rate of £80.

*Liverpool Royal Children's Hospital.*—Two Res. H.P.'s and Two Res. H.S.'s for City Branch, Myrtle-street. Each at rate of £100. Also Res. Med. O. and Res. Surg. O. for Heswall Branch. At rate of £120.

*London Hospital, E.*—Asst. Physician.

*London Lock Hospital, 91, Dean-street, W.*—Surg. Reg. £100.

*Manchester, Ancoats Hospital.*—H.S. At rate of £100.

*Manchester Northern Hospital for Women and Children, Park-place, Cheetham Hill-road.*—Sen. and Jun. H.S. £130 and £100 respectively.

*Margate and District General Hospital.*—Res. M.O. £150.

*Miller General Hospital, Greenwich-road, S.E.*—Hon. Asst. Physician.

*Ministry of Health, Whitehall, S.W.*—Vacancy. £833.

*Newark General Hospital.*—Res. H.S. £175.

*Newcastle-upon-Tyne, City and County of.*—Asst. M.O.H. £750.

*Newcastle-on-Tyne, Wooley Sanatorium, near Hexham.*—Jun. Asst. M.O. £250.

*Norwich, Norfolk and Norwich Hospital.*—Cas. O. and H.S. Also H.S. to Special Depts. Each £120.

*Nottingham and Midland Eye Infirmary.*—Hon. Asst. Surgeon.

*Preston, Lancashire Mental Deficiency Acts Committee.*—Asst. M.O. £600.

*Putney Hospital, Lower Common, S.W.*—Surgeon.

*Queen Mary's Hospital for the East End, E.*—Surg. and Dental Anæsthetist. 50 gns. and £25 respectively.

*Rotherham Hospital.*—Cas. H.S. £150.

*St. Batholomew's Hospital, E.C.*—Asst. Surgeon.

*St. John's Hospital, Lewisham, S.E.*—Hon. Anæsthetist.

*St. Leonards-on-Sea, Buchanan Hospital.*—Two Hon. Anæsthetists.

*Salford, Hope Hospital, Pendleton.*—Asst. Res. M.O. At rate of £250.

*Salisbury General Infirmary.*—Two H.S.'s and H.P. Each at rate of £150.

*Southend-on-Sea General Hospital.*—Res. Obstet. House Officer.

*Sudan Medical Service.*—Two M.O.'s. Each £E720.

*Taunton and Somerset Hospital.*—H.P. £100.

*Walsall General Hospital.*—H.S. At rate of £150.

*West London Hospital, Hammersmith-road, W.*—Asst. Phys. for Diseases of Children. Also Asst. Gynæcologist.

*Westminster Hospital, Broad Sanctuary, S.W.*—Clin. Asst. to Dental Dept.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Lydd (Kent), Reynoldstone (Glamorgan), Loughton (Essex), Diss (Norfolk), Kilbride (Bute), and Whittlesey (Cambridge).

AMBULANCE TRAINING OF RAILWAY EMPLOYEES.—The ambulance centre of the London Midland and Scottish Railway is able to report that over 8800 members of the staff have been successful in passing examinations this year. Thirty members of the company's staff and members of the medical profession assisting at L.M.S. centres have been honoured by the St. John Ambulance Association.